AIIMS MAY 2006

ANATOMY

1. The cell Junctions allowing exchange of cytoplasmic molecules between two cells are called:

A. Gap Junctions B.Tight Janctions
C. Anchoring Junctions D. Focal Junctions

Ans. 1. (A) Gap Junctions

(Ref: Anthony's textbook of Anatomy and physiology- 14th Ed/Pg 74)

"Gap junctions are a type of inter-cellular junction comprising a narrowed portion of about 3nm. Of the inter cellular space: that contains channels or pores (2nm) composed of hexagonal arrays of membrane spanning proteins around the central lumen (connexon) through which ions and small molecules such as most sugars, amino acids, nucleotides, vitamins, hormones and cyclic AMP."

Dorland's Pocket medical dictionary – 25thEd/Pg 433:

Cell connections

There are 3 major forms:

DESMOSOMES	GAP JUNCTION
Are like small 'spot-welds' that hold adjacent cell together. Fibres on the outer surface of each desmosome interlock with each other. Internally then are anchored by fibres of the cytoskeleton. **E.g**. Adjacent skin cells	Formed when membran channels of adjacent plasm membranes adhere to each othe **E.g.** Myocardial Fibres, Centr Nervous System

2. The cells belonging to the following type of Epithelium are provided with extra reserve of cell-membrane:

A. Transitional B. Stratified Squamous
C. Stratified Cuboidal D. Stratified Columnar

Ans. 2. (A) Transitional

(Ref: Anthony's textbook of Anatomy and Physiology –14th Ed/Pg 105, 106)

"An extra reserve of cell-membrane is required at sites that are subjected to stress and tension changes such sites like the wall of urinary bladder are typically supplied by transitional epithelium, a stratified tissue; that has the property to cope up with stretching and tension."

- Transitional epithelium has several layers of cells of varying shape in the absence of stretching or tension.
- As tension increases the epithelium sheet is expanded and the number of observable cell layers (the reserve) will decrease and cell shape will change (from cuboidal to squamous) in appearance.
- The ability to transitional epithelium to stretch protects the distensible structures that it lines from tearing when stretched with great force.

3. All the following muscles are grouped together as muscle of mastication except:

A. Buccinator B. Masseter C. Temporalis D. Pterygoids

Ans. 3. (A) Buccinator

(Ref: B.D.Chaurasia – 3nd Edition, Vol 3/Pg115)

"*Muscles of mastication* include muscles which move the mandible during mastication and speech, these include":-

(a) Masseter
(b) Temporalis
(c) Lateral pterygoid
(d) Medial pterygoid

Movements of Mandible caused by muscles of mastication are:

(a) Depression - Lateral pterygoid
(b) Elevation - Medial pterygoid and Masseter, Temporalis.
(c) Protrusion - Medial and lateral pterygoid.
(d) Retrusion - Posterior Fibres of Temporalis.
(e) Side - side - Medial and lateral pterygoids acting alternatively (AIIMS Nov' 2006)

4. The development of first connection tissue which forms "non synovial joint" is called as:

A. Syndesmosis B. Synchondrosis C. Symphysis D. Suture

Ans. 4. (B) Synchondrosis

(*Still searching for a proper reference. Go through the following lines from Inderbir Singh* 6th Ed/132.)

"The tissues of joints are derived from Mesenchyme intervening between developing bone ends.This Mesenchyme may differentiate into fibrous tissue, forming a fibrous joint (Syndesmosis), or into cartilage forming a cartilaginous joint. In the case of some cartilaginous joints (synchondrosis or primary cartilaginous joints), the cartilage connecting the bone is later ossified, with result that the two bones becomes continuous. This is seen, typically, at the joints between the diaphysis and epiphysis of long bones."

From the above text the answer can be between Syndesmosis and synchondrosis. I will give my choice as synchondrosis for this question.

PHYSIOLOGY

5. The Buffering capacity of a buffer is maximum at pH equal to

A. 0.5pKa B. pKa C. pKa+1 D. 2pKa

Ans. 5. (B) pKa

(Ref: Harper- 25th Ed/Pg 23)

"***At values close to pKa the buffer solution resists changes in pH most effectively."***

• Buffers resist a change in pH when proteins are produced or consumed.
• Maximum buffering capacity occurs at I pH unit on either side of pKa.
• Physiologic buffers include bicarbonates, orthophosphates and proteins.

-Harper 26th Ed/Pg 13.

At pH = pKa, the solution would contain acid and base in an equal amount, and therefore would resist a change most effectively in either direction.

Strong acids have low pKa values & weak acids have high pKa values

BIOCHEMISTRY

6. Which of the following is not a post-transcriptional modification of RNA?

A. Splicing B. 5'- capping
C. 3'-poly adenylation D. Glycosylation

Ans. 6. (D) Glycosylation

(Ref: Harper –26th Ed/Pg 355.)

Glycosylation has not been mentioned as a post-transistional modification of RNA.

5' - capping:

Is required both for efficient translation initiation and protection of 5' - end of MRNA from attack by 5'-3' exonucleases.

3' - poly adenylatlon:

Added to 3'-end of mRNA molecules in a post transcriptional processing step. This appears to protect the 3'-end of mRNA from 3' - 5' exo-nuclease attack.

Splicing (Removal of introns):

Introns or intervening sequences that do not code for proteins are removed.

This splicing occurs in the nucleus and serves to bring the exons together. After removal of introns the mature mRNA molecules leave the nucleus.

7. The following separation techniques depend on molecular size of proteins?

A. Chromatography on a carboxymethyl cellulose column.
B. Iso-electric focusing
C. Gel Filtration chromatography.
D. Chromatography on a diethylaminoethyl (DAAE) cellulose column.

Ans. 7. (C) Gel Filtration chromatography

(Ref: Harper- 26th Ed/Pg 21, Chatterjee-4th Ed/Pg 73.)

"Chromatography is a method of separation of molecules that involves passing a solution through a medium that shows selective absorption for different solute components."

Size - exclusion chromatography / Gel Filtration:

Chromatography separates proteins based on their 'stokes radius', the diameter of the sphere they occupy as they tumble in solution. It is the function of molecular mass and shape.

Iso - electric focusing:

It separates proteins based on isoelectric pH. This technique takes the advantage of the fact that each protein has a different pH at which it is electrically neutral. This technique uses electricity and is therefore electrophoresis.

Ion - exchange chromatography:

(a) On a carboxymethyl cellulose medium.
(b) Diethyl amino ethyl cellulose medium.

This technique separates proteins based on electrostatic attraction between charged molecules and oppositely charged groups on ion exchange resins.

8. ®-Oxidation of odd- chain fatty acids produces:

A. Succinyl CoA B. Propionyl CoA
C. Acetyl CoA D. Malonyl CoA

Ans. 8. (B) Propionyl CoA

(Ref: Harper- 26th Ed/Pg 181)

In β-oxidation, "2" carbon atoms at a time are cleared from Acetyl-CoA molecules, starting at carboxyl end. The chain is broken between the ⟨-2 and ®-3 carbon atoms.

Hence the name β *-oxidation.*

Fatty acid with an odd no. of carbon atoms are oxidized by the pathway of β- *Oxidation* producing Acetyl CoA, until a three carbon atom molecule propionyl CoA molecule remains.

Harper Page No. 182

Similarly end product of β-*oxidation* of even chain fatty acid is Acetyl CoA.

Example - Palmitoyl CoA on oxidation produces eight acetyl CoA after going 7 cycles of β-oxidation.

9. The protein rich in basic amino acids which functions in the packaging of DNA in chro mosomes is:
A. Histone B. Collagen
C. Hyaluronic acid binding protein D. Fibrinogen
Ans. 9. (A) Histone
(Ref: Harper –25th Ed/Pg 412, 413)
"Eukaryotic DNA is associated with - tightly bound basic proteins called *histones* which serve to order DNA into nucleosomes."
"The Eukaryotic DNA is found in association with basic proteins namely histones to form nucleosomes."

10. The primary role of chaperones is to help in:
A. Protein synthesis B. Protein degradation
C. Protein denaturation D. Protein folding
Ans. 10. (D) Protein folding
(Ref: Harper- 26th Ed/Pg 507, 508)
Chaperones are proteins that play a role in proper folding of other proteins without themselves being components of the matter. They stabilize unfolded or partially folder intermediates, allowing them time to fold properly and present in appropriate interactions (prevents formation of incorrectly folded intermediates)
Some properties of chaperones protein:
1. Many are so called "***heat-shocked proteins***"
2. Present in wide range of species from bacteria to humans
3. Some are inducible by conditions that cause unfolding of newly synthesized proteins
4. They bind predominantly to hydrophobic regions of unfolded and aggregated proteins.
5. Found in various cellular compartments such as cytosol, mitochondria and lumen of endo-plasmic reticulum.
Example of some chaperones and enzymes involved in folding that are located in the Rough endoplasmic reticulum:-
1. BiP
2. GRP94
3. Calnexin
4. Calreticulin
5. PDI (Protein Disulphide Isomerase)

DENTAL MATERIALS

11. The force applied during condensation of amalgam having a condenser measuring 2 mm in diameter:
A. 3-4 lb B. 8-17 lb C.10-15 lb D.7-121b
Ans. 11. (A) 3-4 lb
(Ref: Phillips- 11thEd/Pg 529)
The condensation forces in the range of 13.3 - 17.8 N [3 - 4 lb] represents the average force employed.
To ensure maximum density and adaptation to cavity walls, the condensation force should be as great as the alloy will allow.
There are two types of condensation that can be employed:
(a) Hand
(b) Mechanical
The procedures and principles of both the types of condensation are same except that the mechanical condensation is essentially done by an automatic device.
One of the advantages of spherical amalgam alloys is that the strength properties tend to be less sensitive to condensation pressure compared to admixed amalgam alloys.

12. The angles between adhesive and adherent are zero degree. It indicates:
A. Complete wetting of surfaces
B. Rough surfaces between adhesive and adherent
C. Irregularities present between the adherent surfaces.
D. The adherent and adhesive molecule are tangent to each other.
Ans. 12. (A) Complete wetting of surfaces
(Ref: Phillipa –11th Ed/Pg 37, Phillips –10th Ed/Pg 28)
Contact angle is the angle formed between the adhesive and the adherent at their interface.
• If the molecules of adhesives are attracted to molecules of adherent as much as, or more than they are to themselves, the liquid adhesive will spread completely over the surfaces of solid and no angle [$\theta = 0°$] will be formed.*
• Thus, smaller the contact angle between the adhesive and adherent the better the ability of the adhesive to fill in irregularities on the surface of the adherent.
• ***Complete wetting occurs at the contact angle of zero degrees and no wetting occurs at an angle of 180 degrees.*** *
• If the contact angle is < 90 - the result is *depression of liquid**
• The contact angle between *saliva and acrylic denture base is* 75°*
• The contact angle between *glass and mercury is* 135°. *
• *Polysulphides, addition and condensation silicones* have water contact angle of 95°
• *Alginate, Agar and Polyether will have a water contact angle of 30-35 degrees.* *

13. Which of the following is not a true wax?
A. Paraffin B. Ozokerite C. Cocoa butter D. Candelilla

Ans. 13. (C) Cocoa butter

(Ref: Manappalli- 2ndEd/Pg 274, Phillips 11thEd/Pg 285)

"***True waxes" are those waxes which are derived form "Natural Sources" hence also called as "natural waxes'.***

• Natural waxes are derived from mineral, vegetables or animal origins.
• Synthetic waxes are chemically synthesized analogs of natural wax molecules.
• Synthetic waxes are relatively more homogenous and pure than natural waxes.

1. Minerals:

• Paraffin • Microcrystalline
• Barndahl • Ozokerite
• Ceresin • Montan

2. Plants:

• Carnauba • Ouricury
• Candelilla • Japan Wax
• Cocoa Butter

3. Insects:

Bees Wax

4. Animal:

Spermaceti

Synthetic Waxes:

• Acrawax – c • Aerosol, OT
• Castor wax • Flexo Wax - C
• Epolene N-10 • Albacter
• Aldo-33 • Durawax-1032

Additives:

- Fats - Oils
- Turpentine - Color
- Natural resins - Rosin
- Synthetic Resins

14. The half line of mercury in human body is:

A. 55 days B. 55 hours C. 55 week D. 55 months

Ans. 14. (A) 55 days.

(Ref: Sturdevant- 4th Ed/Pg 162.)

"***An average half time of mercury in human body is 55 days".***

Other important facts related to mercury:-

• Mercury that is absorbed in circulatory system may be deposited in any tissue.
• Higher than average accumulations occur in the brain liver and kidneys.
• In the dental office, the dentist, assistant, hygienist and other staff are at more risk of mercury toxicity than patient because of long term contact with mercury vapour.

Pronounced Symptoms:

• Kidney inflammation
• Swollen gums
• Pronounced tremors and nervous system disturbance

Mini to moderate symptoms:

• Irritability, depression, memory loss, minor tremor, and other nervous system disturbances.
• Early signs of disturbed kidney function
• Subtle changes on some tests but no overt symptoms
• Decreased response on tests for nerve conduction, brain-waves activity and verbal skills.

15. The diameter of sprue and sub-surface porosity will have:

A. Direct relationship B. Inverse relationship
C. Inverse square relationship D. No relationship

Ans. 15. (A) Direct relationship

(Ref: Phillips-11th Ed/Pg 345, Phillips l0th Ed/Pg 520)

Subsurface porosity:

• The reasons for such voids have not been completely established.
• They may be caused by the *simultaneous nucleation of solid grains* and gas bubbles at the first moment that the alloy freezes at the mold walls.
• *This type of porosity can be diminished by controlling the rate at which the molten metal enters the mold.*

Porosities in noble metal alloy castings may be classified as follows:

I. Solidification defects:
• Localized shrinkage
• Micro porosity
II. Trapped gases:
• Pinhole porosity
• Gas Inclusions
• Subsurface porosity

III. Residual air:

Table no. 12.3 : Effects of technical factors on the porosity re		
Types of Porosity	**Increased sprue thickness**	**Increased sprue length**
1. Localised shrinkage porosity 2. Subsurface porosity 3. Micro-porosity	Decreased Increased No effect	Increased Decreased No effect

16. The length of sprue and subsurface porosity will have:
A. Direct relationship B. Inverse Relationship
C. Inverse square relationship D. No relationship at all.
Ans. 16. (B) Inverse Relationship
(Ref: Phillip' s-11thEd/Pg 345, Phillip's –11th Ed/Pg 520)
Please refer to previous answer of this paper.

17. Which of the following is not true about casting gypsum bonded investment material:
A. It is used for cast metal alloys
B. 50 - 65% of gypsum changes to form ⟨-hemihydrate
C. The investment material is not heated above 700° temperature
D. Heating above 700° of investment causes formation of sulphur dioxide from copper sulphate.
Ans. 17. (B) 50 -65% of gypsum changes to form a-hemihydrate.
(Ref: Phillips IIth Ed/Pg. 296-297)
The essential ingredients of the dental inlay investment employed with the conventional gold casting alloys are ot-hemihydrate of gypsum, quartz or crysloballite which are allolropic forms of silica.
Thus ⟨-hemihydrate serves as a binder to hold the other ingredients together and provides rigidity.
"***The investment may contain 25 - 45% of calcium sulfate hemihydrate."***
Generally two types of investment
Type A
Gypsum bonded investment.
Type-B
Phosphate bonded investment are employed, depending on melting range of alloys.
Gypsum based material represents the type traditionally used for casting of gold alloys inlays, crowns and FPDs.
• Phosphate bonded investments are designed for alloys used to produce copings and frames
• Work for metal ceramic prosthesis.
• According to ADA specification no. 2 for casting Dental gold alloys encompasses three types of investments. All forms *shrink* considerably after dehydration between 200°-400° C. A *slight expansion* takes place between 400° C and 700° C & large contraction then occurs.
• This latter shrinkage is most likely caused by decomposition and release of sulfur gases such as *sulfur dioxide*. This decomposition not only causes shrinkage but also contaminated the castings with the sulfides of the non noble alloying elements such as silver and copper. Thus it is imperative that *gypsum investment should not he heated above 700°C**

18. Which of the following is not correct about dental stone?
A. High strength low expansion dental stone contains some additive to reduce expansion.
B. Dental stone is manufactured by heating at temperature 110°- 120° C in an open auto clave.
C. Dental stone is much harder and stronger than B-hemihydrate.
D. Microscopically it is seen as cleavage fragments and crystals in the form of rods and prisms.
Ans. 18. (B) Dental stone is manufactured by heating at temperature 110°-120° C in an open autoclave.
(Ref: Phillips-11th Ed/Pg 257,10th Ed/Pgl86)
Gypsum when heated at 110-130° → Plaster or stone,
heated at 130-200°C → Hexagonal anhydrite,
heated at 200- 1000°C → Orthorhombic anhydrite.
If gypsum is heated to temperature in the first part of the reaction in an open kiln or an open autoclave a β-hemihydrate is produced which is irregular and spongy.
But in the question it was asked about dental stone which is an ⟨-hemihydrate which is produced by calcining CaSo4.2H20 in a closed autoclave this leads to significant difference between α and β hemi-hydrate.

19. Like the eutectic transformation, the peritectic reaction is an invariant reaction (i.e. it occurs at a particular composition and temperature). The reaction can be written as:
A. Liquid + β → α
B. Liquid + β →Liquid + α
C. Liquid → α -solid solution + β-solid solution

D. α + β → Liquid

Ans. 19. (A) Liquid + β → α

(Ref: Phillips –10th Ed/Pg 340, 11th Ed/Pg 134).

- Like the eutectic transformation true peritectic reaction is an invariant reaction (i.e. it occurs at a particular composition and temperature)
- The reaction can be represented by: Liquid + β α
- The X phase is a silver rich phase, the B phase is platinum rich and α + β is the two phase region resulting from limited solid solubility. The peritectic transformation occurs at the point P at which the liquid plus the platinum rich ® phase transforms into the silver rich a phase.
- Similarly the eutectic reaction can be written as Liquid → Solid solution

This reaction refers to as invariant transformation because it occurs at single temperature and composition*

The eutectic system is an example of an alloy for which components metals have limited solid solubility. *

PATHOLOGY

20. Which of the following procedures is routine technique for karyotyping using light microscopy:

A. C-banding B. G – banding C. Q-banding D. Brd V - Staining

Ans. 20. (B) G - Banding

(Ref: Robbins 6th Ed/165, Harshmohan 4th Ed/886)

*"***The most commonly employed staining method uses a Giemsa Stain and hence is called G-banding"**

A karyotype is a standard arrangement of a photographed or image stained chromosomes, where

- Chromosomes are in metaphase stage
- *Mitosis is arrested in dividing cells in meta phase stage by use of colchicines*
- In metaphase stage individual chromosomes take the form of two chromatids, connected at the Centromere.
- Chromosomes are arranged in pairs.
- Chromosome pairs are arranged in decreasing order of length.

Staining:

Staining allows identification of each individual chromosome on the baser of distinctive and reliable pattern of alternating light and dark bands. One of the following banding techniques may be used.

G-Banding (Giemsa Banding)	**Q-Banding (Quinacrine Banding)**	**C-Banding (Constitutive Banding)**
Most Commonly used	used Demonstrates bands along chromosomes	Demonstrates c hetero chromati

21. An Albino girl gets married to a normal boy. What are the chances of their having an affected child and what are the chances of their children being carriers:

A. None affected, all carriers B. All normal

C. 50% carriers D. 50% affected, 50% carriers

Ans. 21. (A) None affected, all carriers

(Ref: NCERT text book. Genetic topic-XII standard)

Albinism is an autosomal Recessive disorder

- An albino would thus represented by A+A+
- A normal individual would be represented by A-A-
- A carriers individual would be represented as A+A-
- The possibilities arising out of a marriage between an albino and normal individual would be:

As we can see all the springs are carriers and none is affected

22. Osteomalacia is associated with:

A. Decrease in osteoid volume B. Decrease in osteoid surface

C. Increase in osteoid maturation time D. Increase in mineral opposition rate.

Ans. 22. (C) Increase in osteoid maturation time

(Ref. Indirect reference from Robbin's and Harshmohan)

Osteomalacia

Osteomalacia is characteristically described as a mineralization disorder manifested exclusively by defect in mineralization of newly forming bone.

Patho-physiology

Abnormal mineralization /decrease in deposition of mineralized bone (i.e. decrease in mineral opposition rate)

Matrix continues to be secreted but is not mineralized (i.e. osteoid does not mature or increase in osteoid maturation time.

Also, seen is-

- Increased thickness of osteoid
- Increased volume of osteoid.
- Increased in bone surface covered by osteoid.

23. In leukemic patient, gingival bleeding occurs during oral prophylaxis because of
A. Increased leukocytes count B. Increased calcium level in blood
C. Platelet disorder D. Deficiency of clotting factor
Ans. 23. (C) Platelet disorder
(Ref: Carranza –9thEd/ Pg 216)
• Gingival hemorrhage is a common finding in leukemic patients, even in the absence of clinically detectable gingivitis.
• Bleeding gingiva can be an early sign of leukemia.
• It is due to the *thrombocytopenia* that results from replacement of the bone marrow cells by leukemic cells and also from the inhibition of normal stem cell function by leukemic cells or their products.
Other symptoms related to depression of bone marrow in leukemia are:
• Fatigue due to anemia
• Fever due absence of mature leucocytes
• Bone pain and tenderness from bone marrow expansion - Ref. Robbins 7th Ed. Page 673

24. The average number of CD4 cells in body fluid is:
A 800-1000/mm3 B.800-1200/mm3 C. 500-800/mm3 D. 400-600 /mm3
Ans. 24. (B) 800- 1200/mm3
(Ref: Robbins Basic pathology – 6th Ed/I 24, Figs. 5 -37)
• ***The normal CD4 count is ranging form 8W - 1200/mm3***
• Less than 500/*mm3* counts show *symptoms of HIV infection*. *
• People with healthy immune system usually have more than **950 CD4 cells/ul** of blood.
- Ref. Park 18th Ed /278.

MICROBIOLOGY

25. Heat labile instruments for use in surgical procedures can be sterilized by:
A. Absolute alcohol B. Ultra violet rays
C. Chlorine releasing compounds D. Ethylene oxide gas
Ans. 25. (D) Ethylene oxide gas
(Ref: Medial Microbiology by Greenwood 12th Ed/ 61)
Ethylene oxide
• It is a highly penetrative non corrosive, microbiocidal gas
• ***It acts as an alkylating agent***
• It is effective against all types of micro organism including virus and spores.
• It is used for:
(a) Sterilization of heat sensitive medical devices, prosthetic heart valves and plastic catheter
(b) Sterilization of heart lung machines, respirators, sutures, dental equipment
(c) Sterilization of glass, metal, paper, clothing, plastic, soil, food stuff and tobacco
(d) It is explosive and is unsuitable for fumigating room.
Alcohol
• Ethyl alcohol and isopropyl alcohol are used
• They are bactericidal and action against virus is good.
• They have no action against spores
• Recommended as rapidly drying disinfectants for skin and surface disinfection of clinical thermometers.
U.V. Rays
• Low energy, non-ionizing radiation with poor penetrating power.
• Is used for disinfecting enclosed areas such as entry ways, hospital wards operation theater and virus laboratories.
Chlorine releasing Compounds:
• ***Chlorine*** is used most commonly as hypochlorite.
• They are markedly bactericidal and have a wide spectrum of action against viruses.
• They are used as antiseptics for dressing wound and for disinfection of water.

26. A 60 year old man is diagnosed to be suffering from legionnaire's disease after he returns from attending a convention. He could have acquired it:
A. From a person suffering form the infection while traveling in the aeroplane
B. From a chronic carrier in the convention center
C. From inhalation of the aerosols in the air conditioned room at convention centre
D. By sharing an infection towel with a fellow delegate at the convention.
Ans. 26. (C) From inhalation of the aerosols in the air conditioned room at convention centre
(Ref: Anantnarayan 6th / 377)
• Legionella (a gram negative, motile, non encapsulated bacilli)
• Survives and multiply inside free living amoeba and protozoa, distributed in natural reservoirs such as stagnant water, mud, hot springs.
• Aerosols from these natural reservoirs, inhaled by humans serve as the most common source of infection in men.

• Man to Man transmission does not occur, "outbreaks have been associated with
• No animal reservoir occurs contaminated water sources such as air
• Disease is limited to humans conditioning cooling towers"- CMDT/2002/148

Legionnaire's pneumonia

• Pneumonia presents with mild cough, slightly productive sputum, sometimes streaked will blood, along with fever and non specific symptoms such as malaise, fatigue, anorexia and headache.
• Blood borne dissemination lo extra pulmonary sites

1. Heart:

Myocarditis / pancarditis / Endocarditis
Heart is most common extra pulmonary site of legionellosis.

2. Kidney: Pyelonephritis
3. GIT: Peritonitis, Pancreatitis and Diarrhea
4. Sinusitis

Known risk factors are smoking, alcohol, advanced age, recurrent illness, hospitalization and immunodeficiency.

27. The most common micro organism causing sub-acute bacterial endocarditis after oral surgical procedure is:

A. Streptococcus viridans B. Streptococcus muta
C. Staphylococcus aureus D. Staphylococcus albus

Ans. 27. (A) Streptococcus viridans

(Ref: Harrison's –16th Ed/Pg 823)

"S.viridans which is a part of the normal oral flora is important agent of sub acute bacterial en-docarditis."

PHARMACOLOGY

28. An anesthetist orders a new attendant to bring the oxygen cylinder. He will attendant to identify the correct cylinder by following color code:

A. Black cylinder with white shoulder B. Black cylinder with grey shoulder
C. White cylinders with black shoulders D. Grey cylinder with white shoulder

Ans. 28. (A) Black cylinder with white shoulder

(Ref: Lee's anesthesia –12th Ed. / pg 104, 105)

Gas Color of Cylinder.

1. Oxygen	Black body, white shoulder
2. Air	Grey body, black and white shoulder
3. N20	Blue
4. Entonox (50% 02+50% N20)	Blue body, white and blue quartered shoulder
5. Cyclopropane	Orange
6. Carbon dioxide	Grey
7. Thiopentone	Yellow
8. Halothane Amber	(purple and red)

- Please remember this chart as this is not given in frequently used textbooks.

29. 50% eyelid Ptosis, blurring of vision, slurring of speech, indicating the correct level after Diazepam sedation is best explained by:

A. Tinel's sign B. Verill's sign C. Corman's sign D. Bell's sign

Ans. 29. (B) Verill's sign

(Ref. Neelima Malik IstEd. /650)

Tinel's Sign

• Tinel's Sign was used earlier as an indication of the *start of nerve regeneration**
• It is elicited by percussion over the divided nerve, which results in the tingling sensation in the part supplied by the peripheral section.

Verill's Sign

3 symptoms
• 50% eyelid Ptosis
• Blurring of vision
• Slurring of speech, indicating the correct level after Diazepam sedation. Corman's Sign:
• Seen in Mandibular Fracture.
• Ecchymosis in the lingual sutures is pathognomic of mandibular fracture.

Bell's Sign: *(Neelima Malik Ist Ed./ 668)*

In an attempt to close the eyelid, the eyeball rolls, upward so that the pupil is covered and only the white sclera is visible in *Bell's sign*.

So the correct answer is (B) Verill's Sign.

30. All the following statements regarding bioavailability of a drug are true, except:

A. It is the proportion (fraction) of unchanged drug that reaches the systemic circulation
B. Bioavailability of an orally administered drug can be calculated by comparing the under curve (o-〈) after oral and intravenous (iv) administration.
C. Low oral bioavailability always and necessarily means poor absorption.

D. Bioavailability can be determined from plasma concentration or urinary excretion data.
Ans. 30. (C) Low oral bioavailability always and necessarily means poor absorption
(Ref: K.D.T. – 5th Ed /Pg No. 15)
Bioavailability: (*Katzung- 8th Ed. Pg. No. 42)*
Bioavailability refers to the rate and extent of absorption of a drug from a dosage form as determined by its concentration - time curve in blood or by its excretion in urine.
It is a measure of the fraction (F) of administered dose of a drug that reaches the systemic circulation in the unchanged form.
Bioavailability of drug injected I.V. is 100% but is frequently lower after oral ingestion because
(a) The drug may be incompletely absorbed.
(b) The absorbed drug may undergo first pass metabolism in intestinal wall / liver or be excreted in bile.
The systemic bioavailability of drug can be predicted from extent of absorption (Function of conc.in plasma) and extraction ratio.

31. Hemorrhage secondary to heparin administration can be corrected by administration of:
A. Vitamin K B. Whole Blood C. Protamine D. Ascorbic acid
Ans. 31.(C) Protamine
*(*Ref. USP — Drug information for health care professionals)
(K.D.T- 5th Ed/ Page 564.)
Protamine is indicated in the treatment of severe Heparin overdose resulting in hemorrhage,
• Termination of bleeding following administration of oral anticoagulants e.g. warfarin is done by Vit. K (phytonadione)
Protamine — is a low molecular wt. strongly basic protein.
- obtained from sperms of certain fish
- *Given I.V. it neutralizes Heparin wt. for wt. i.e. 1mg for every 100 units of Heparin**
- However it is used infrequently because action of heparin disappears by itself in few hours.
- It is needed more commonly when heparin action needs to be terminated rapidly.
E.g. After cardio-vascular surgery.

DENTAL ANATOMY

32. The pulp of 1st primary molar contains:
A. 4 pulp horns & 3 root canals B. 3 pulp horns & 3 root canals
C. 2 pulp horns & 2 root canals D. 2 pulp horns & 3 root canals
Ans. 32. (A) 4 pulp horns & 3 root canals
(Ref: Wheeler's 6th Ed. /59, Arup K Das Ist Ed/61)
"First primary molar contains usually 4 cusps, a pulp horns and three roots"
- The pulp chambers of deciduous teeth are larger and pulp horns are placed in higher position.
- The enamel pulp and dentin thickness is limited making the pulp chambers shallow.
- The pulp canals are wider and the apical portion of the canal is much less constricted than that of permanent teeth.
- The roots of primary molars are longer, slender more divergent and flared to accommodate the developing permanent tooth crowns.

DENTAL HISTOLOGY

33. Which of the following does not contain Taste Buds?
A. Circumvallate papillae B. Filliform papillae
C. Fungiform papillae D. Foliate papillae
Ans. 33. (B) Filliform papillae
(Ref. Orban's –11th Ed/Pg. 307)
Taste buds are numerous on inner walls of the trough surrounding the Vallate papillae, in the folds of foliate papillae, in the posterior surface of epiglottis and on some of fungiform papillae tip and lateral borders of tongue.
Taste buds:-These are small, ovoid or barrel-shaped intra-epithelial organs, about 80 *um* high and 40 *um* thick

Taste	**Location**
Sweet	Tip of tongue
Salty	Lateral borders of tongue

Bitter and sour on palate and posterior border of tongue
Bitter in middle and sour on lateral areas of tongue
As we all know that there are only 4 tastes sensation but you would all be surprised to know that the 5th one has been described lately which is called "umami"-Ganong 22nd Ed/ 189
Umami: *In this the taste is pleasant and sweet but differs from standard sweet taste.*

34. The disturbances occurred during "calcification" stage of tooth development are seen in:
A. Peg lateral B. Microdontia C. Supenumery tooth D. Interglobular dentin
Ans. 34. (D) Interglobular dentin
(Ref: Orban's – 11th Ed. /117)
This is an easy one to answer, as we all can easily exclude the rest. So just to refresh your knowledge with few points here:
- **Peg shaped lateral**: - *Ref. Orban's 11th Ed/47*
It is due to disturbances in morpho- differentiation. It is due to failure of middle/ central lobe of the tooth to develop.
- **Mirodontia**: It is also due to disturbances in morpho differentiation stage of the tooth development.
- **Supernumerary Tooth**: - It is due to disturbance in the histo- differentiation stage.
- **Interglobiilar dentin**: - Sometimes mineralization ofdentin begins in small globular area that fails to coalesce into honnogeneous masses, which results in zone of hypomineralization between the globules.

Hence, it shows that the interglobular dentin is a result of defect in calcification.

GENERAL MEDICINE

35. Thirty eight children consumed eatables procured form a single source at a picnic party. Twenty children developed abdominal cramps followed by vomiting and watery diarrhea 6-10 hours after the party. The most likely etiology for the outbreak is?

A. Rotavirus infection B. Entero-toxigenic E-coli infection
C. Staphylococcal toxin D. Clostridium perfringens infection

Ans. 35. (D) Clostridium perfringens infection.

(Ref: Harrison's-15th Ed/Pg 837)

Clostridium perf'ringens infection characteristically presents **after 8 to 16 hours*** of consumption of food material and causes *abdominal cramps*, followed by *diarrhea*. *Vomiting* as well may occur though rare. Thus all features presented in question are consistent with a diagnosis of clostridium perfringens infection

Bacterial food poisoning

36. In a post-operative intensive care-unit, five patients develop post- operative wound infection in the same ward.The best method to prevent cross infection in other patients in the same ward is to?

A. Give antibiotics to all other patients in the ward.
B. Fumigate the ward
C. Disinfect the ward with sodium hypochlorite
D. Practice proper hand washing.

Ans. 36. (D) Practice proper hand washing

(Ref. Harrison's –16th Ed. Page 776)

The mode of transmission most often is either cross-infection (e.g. indirect spread of pathogen from one patient to another on the inadequately cleaned hand of hospital personnel) or autoinoculation.(E.g. Aspiration of oro-pharyngeal flora into the lungs along an endotracheal tube.) Given the importance of cross infection hand washing is the single most effective preventive measure in the hospital

37. A 5 years old boy passed 18 loose stools in last 24 hours and twice vomited in last 4 hours. He is irritable but drinking fluids. The optional therapy for this child is:

A. Intravenous fluids
B. Oral rehydration fluids
C. Intravenous fluid initially for 4 hours followed by oral fluids
D. Plain water ad libitum

Ans. 37. (B) Oral rehydration fluids

(Ref. O.P. Ghai 5th Ed/Page 249,250)

Here, we see that the child is irritable but drinking fluids. He thus falls in the category of some dehydration and needs to be managed in accordance with plan B. Treatment plan B is oral rehydration therapy and hence the answer.

Treatment plan A:

No signs of Dehydration:-
- Mothers educated to use increased amount of home available fluids.
- ORS packets given for use at home.

Treatment Plan B:
- Some physical signs of dehydration.

Rehydration therapy:

Correction of existing water and electrolyte deficit.
- 75ml/kg ORS is first 4 hours

Maintenance therapy:
- Replacement of ongoing losses due to continuing diarrhea.
- Begins when sign of dehydration disappear usually in First 4 hours

10-20 ml/kg ORS for each liquid stool.*

Treatment Plan C:

Start IV fluid immediately.
Best IV fluid solution is Ringer-lactate
Normal saline can be used.
100 mg/kg is to be given as shown:

Age First Then

<12 months 30 ml/kg in 1hr. 70 ml/kg 5 hrs
12 mths to 5yrs 30 minutes 21/2 hours

38. Bedsore is an example of:

A. Typical ulcer B. Trophic ulcer
C. Venous ulcer D. Post-thrombotic ulcer

Ans. 38. (B) Trophic ulcer
(Ref. Short cases by S.Das , Bailey & Love 24th Ed/939 2nd Ed. 46)
"Trophic ulcers are *neurogenic ulcers* which are caused by various factors such as impairment of nutrition of the tissues inadequate blood supply and neurological deficit"
Bedsore is included in the groups of "*trophic ulcers"*

39. The most common histological type of thyroid cancer is:
A. Medullary type B. Papillary type
C. Follicular type D. Anaplastic type
Ans. 39. (B) Papillary type
(Ref. Robbins 7th Ed/1178, Bailey & Love 24th Ed./ 797)
"*Papillary carcinomas are the most common types of thyroid cancer". They occur mostly in 20's -40's of life and accounts for majority of thyroid carcinomas associated with previous exposure to ionizing radiation.* *
Acc.To Robbins – 5th Ed. / 1136
Papillary ca - 75-85%
Follicular ca - 10-20%
Medullary ca - 5%
Anaplastic ca rare
Ace. To Bailey & Love 24th Ed./797
Papillary ca - 60%
Follicular ca - 20%
Medullary ca - 10%
Anaplastic ca 5%
Papillary ca - Nuclei of papillary Ca cells contains finely dispersed chromatin which imparts an optically clear or empty appearance giving rise to the designation "*Ground glass*" or "**ORPHAN ANNIE EYE**" Nuclei.*
• Also '*psammoma bodies 'are often present within the lesions.* *
• Lymph node is most commonly involved.
• Prognosis is best.

COMMUNITY DENTISTRY & P.S.M

40. For the calculation of positive predictive value of a screening test, the denominator is comprised:
A. True positives + False Negatives B. False Positives + True Negatives
C. True Positives + False Positives D. True Positives + False Positives
Ans. 40. (C) True Positives + False Positives
(Ref. Park – 18th Ed. /117, Park –17th Ed./111)

$$\text{Sensitivity} = \frac{\text{True Positive}}{\text{True positive + False Negative}} \times 100$$

$$\text{Specificity} = \frac{\text{True Negative}}{\text{True Negative + False positive}} \times 100$$

$$\text{Predictive Value of Positive test} = \frac{\text{True Positive}}{\text{True positive + False positive}} \times 100$$

$$\text{Predictive value to Negative test} = \frac{\text{True Negative}}{\text{True Negative + False Negative}} \times 100$$

41. The parameters of sensitivity and specificity are used for assessing:
A. Criterion Validity B. Construct Validity
C. Discriminate Validity D. Content Validity
Ans. 41. (A) Criterion Validity
(Ref: Dictionary of Public Health by J. Kishore /559)
Criterion Validity
Extent to which the measurements correlate with an external criterion of the phenomenon under study. Two aspects of criterion validity are seen:-
(a) **Concurrent validity**: - Measurement and criterion refer to the same point of time.
e.g.: In a visual inspection of a wound for evidence of infection validated against bacterio-logical examination of a specimen taken at the same time.
(b) **Predictive Validity**: - The measurement validity is expressed in terms of its ability to predict the criterion.
E.g. In an academic aptitude test that is validated against subsequent academic performance

42. A measure of location which divides the distribution in the ratio of 3:1 is:
A. Median B. First quartile C. Third Quartile D. Mode
Ans. 42. (C) Third Quartile

*(*Ref. *Mahajan*-biostatistics*)*
(Quartiles denote division of entire range of distribution into four parts of equal probability by three equidistant points.
Quartile: Will have 25% observations to the left and 75% to the right.
2nd Quartile: Will have 50% observations on either side.
3rd Quartile: Will have 75% observations to the left 25% on the right.
- The division in question is 3:1. This would mean three observations stand to the left and one of the right in a range of 4 (3+1) i.e. *third quartile*.
- First quartile would divide the observations in a ratio of 1:3 and not 3:1.
- **Median** is the mid value when values are arranged either in an ascending or descending order.
- **Mode** is the most commonly occurring value.

43. Chi- Square test is used to measure the degree of:
A. Causal relationships between exposure and effect.
B. Association between two variables.
C. Correlation between two variables
D. Agreement between two observations.
Ans. 43. (B) Association between two variables
(Ref. Park 18th / Page 650)
- **The chi-square test is used to measure the qualitative data not quantitative data.**
- *The test of association between two events is the most important application of the chisquare test is statistical method.*
- It measures the probability of association between two discrete attributes
- The chi-square test assumes that no association occurs between two events in question unless proved otherwise - *Null Hypothesis*.
- The Chi-square test has an added advantage. It can be applied to find association or relationship between two discrete attributes when there are more than two class or groups as happens in multinomial samples.
- Chi-square test offers an alternate method of testing significance of difference between two proportions.

44. Elements of primary healthcare include all of the following, except:
A. Adequate supply of safe water and basic sanitation. B. Providing essential drugs
C. Sound referral system. D. Health education.
Ans. 44. (C) Sound referral system.
(Ref. Park 18th Ed/Pg 28)
The concept of primary health care came into limelight in 1978 following an international conference in Alma- Ata (USSR).
• The primary health care approach is based on principles of social equity, nationwide coverage, self reliance, inter-sectorial co-ordination and people's involvement in planning.
The declaration of Alma Ata has outlined 8 essential components of Primary Health Care. These are:
• Education concerning prevailing health problems and methods of prevention and control.
• Promotion of food supply and proper nutrition.
• Adequate supply of safe water and basic sanitation.
• Maternal and child health care, including family planning.
• Immunization against major infectious diseases.
• Prevention and control of locally endemic disease.
• Appropriate treatment of common diseases and injuries.
• Provision of essential drugs.

45. In water Fluoridation of a Community which of the following sequential order is correct:
A. Decayed tooth, central water supply agency, fluoride concentration in water and community applicant.
B. Decayed tooth, fluoride concentration in water, central water supply agency and community applicant.
C. Community applicant, decayed tooth, central water supply agency and fluoride concentration in water.
D. Central water supply agency, decayed tooth, community applicant and fluoride concentration in water.
Ans. 45. (B) Decayed tooth, fluoride concentration in water, central water supply agency and community applicant
We don't think there is need for any reference for this question, as it is the only logical sequence.
Go through chapter fluoride from Sober Peter as this chapter is considered very important from entrance exam point of view.

46.The age of the child used in the determination of child mortality rate is:
A 0-5 years B.1-4 years C. 5-8 years D. 0 -I year
Ans. 46. (B) 1-4 years
(Ref: Park-18th Ed. /23.)
Child Mortality Rate:
• Another indicator related to the overall health status is the early childhood (1 - 4 years) mortality.
• It is defined as the number of deaths at ages 1 -4 years in a given year, per 1000 children in that age group at the mid-point of the year concerned.

47. Primordial prevention is used to:
A. Prevent development of risk factor in the community.
B. Prevent the transmission of diseases.
C. Prevent the development of diseases.
D. To establish the diagnosis and treatment of disease.

Ans. 47. Answer is: A- Prevent development of risk factor in the community
(Ref: Park-18th Ed. /37.)
Primordial Prevention
• *Primordial Prevention a new concept is receiving special attention in the prevention o fchronic diseases.**
• This primary prevention in its purest sense, that is prevention of the emergence or development of risk factor in countries or population groups in which they have not appeared.
• For example, many adult health problems (e.g. obesity, hypertension) have their early origins in childhood, because this is the time when lifestyles are formed (for example, smoking, eating patterns, physical exercise)
• In primordial prevention, efforts are directed towards discouraging children from adopting harmful lifestyles. The main intervention in primordial prevention is through individual and mass education.

ORAL PATHOLOGY & MEDICINE

48.A tumor occurred in oral cavity which is represented as T3 N2 MO. This tumor is classified as:
A. Stage I B. Stage II C. Stage III D. Stage IV
Ans. 48, (D) Stage IV
(Ref: Harrison-16th Ed, table no. 87- 1, Pg. No. 505).
REGIONAL LYMPH NODES (N)
NX Regional lymph nodes cannot be assessed
NO No regional lymph node metastasis
N l Metastasis in a single Ipsilateral lymph node,3 cm or less in greatest dimension
N2 Metastasis in a single ipsilateral lymph node, more than 3 cm but not more than 6 cm in greatest dimension; or in multiple ipsilateral lymph nodes, none more than 6 cm greatest dimension; or in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension
N2a Metastasis in single ipsilateral lymph node more than 3 cm but more than 6 cm in great dimension
N2b Metastasis in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension
N2c Metastasis in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension
N3 Metastasis in a lymph node more than 6 cm in greatest dimension
DISTANT METASTASIS (M)
MX Presence of distant metastasis cannot be assessed
MO No distant metastasis
MI Distant metastasis
STAGE GROUPING

Stage 0	Tis	N0	M0	Stage IV	T4	N0	M0
Stage I	Tl	N0	M0		T4	Nl	M0
Stage II	T2	N0	M0		Any T	N2	M0
Stage III	T3	N0	M0		Any T	N3	M0
	T1	Nl	M0		Any T	Any N	M1
	T2	Nl	M0				
	T3	Nl	M0				

49.The characteristic "Multiple punched out lesion" is seen in :
A. Multiple myeloma B. Hyperparathyroidism
C. Fibrous Dysplasia D. Osteosarcoma
Ans. 49. Answer is: A- Multiple myeloma *(Ref. Shafer 4th Ed. / Pg No. 192)*
Roentgenographic Features of multiple myeloma
Roentgenographic, examination will usually reveal numerous sharply *punched-out* areas in a variety of bones, which may include the vertebrae, ribs, skull, jaws and ends of long bones.
- Note that these are all sites of active haematopoesis.
- These lesions may vary in size from a few millimeters to a centimeter or more in diameter but there is usually no peripheral bone reaction. Diffuse destructive lesions of bone may occur.

Radiographic features of Hyperparathyroidism
The bones of affected person show greater radiolucency as compared to that of normal people.Later sharply defined round or oval radiolucent areas develop.
Fibrous Dysplasia
Radiographic feature is extremely variable there may be three basic patterns.
• Small unilocular radiolucency or larger multilocular radiolucency both with well circumvented border or fine network of trabeculae.
• Similar to the previous one except that increased trabeculation renders lesion more opaque.
• Quite opaque giving a ground glass or "*Peau- d -orange appearance"*
steosarcoma
In Osteosarcoma there is characteristic "*sunray appearance*". This is due to trabeculae of new bone radiating outward at the periphery of lesion.
For radiographic features of other bony lesions please refer Q.no.54 MH-CET 2006 paper.

50. The other name for factor XI is:
A. Stuart power factor. B. Calcium ion.
C. Plasma thromboplastin antecedent D. Plasma thromboplastin Component
Ans. 50. (C) Plasma thromboplastin antecedent

(Ref. Shafer- 4th Ed/745, Burkits- 10th Ed/462 table no. 17.5)
International Nomenclature of Blood clotting factor

51. Which of the following sugars present in the human diet is considered the most caries promoting?
A. Sucrose B. Fructose C. Lactose D. Glucose
Ans. 51. (A) Sucrose
(Ref: Shobha Tandon 1st Ed/225)
• The patient diet and dental caries activity are related. From the dietetic view point, dental caries widely accepted as being caused by the ingestion of fermentable carbohydrates, particularly sucrose.
• Fermentable carbohydrates and more specifically sucrose are rarely eaten as such. They are eaten as components of foods that contain other ingredients and have different textures.
• The cariogenic potential of foods containing sucrose, have the ability to
- Be retained by teeth
- Form acids
- Dissolve enamel
- Neutralize or buffer acids.
• Solid and retentive sucrose containing foods are more cariogenic than sugar containing foods that are liquid and non-retentive.
• Sucrose containing food becomes more dangerous if it is eaten more frequently.
• For this reason Sucrose is called as the Arch-criminal of dental canes.
• Also remember Stephan's curve is plotted following a sucrose rinse.

52. The non-cariogenic substitute used to replace the cariogenic diet is
A. Lactose B. Glucose C. Cooked Starch D. Sorbitol
Ans. 52. (D) Sorbitol
"**The alcohol derivatives have been added as substitute for cariogenic diet"**
It is so obvious an answer; I don't think we need a reference.

53. Which of the following is most appropriate therapy for a patient suffering from lesions of infectious mononucleosis?
A. Analgesics B. Antibiotic
C. Anticonvulsant D. No therapy as it is self limiting disease
Ans. 53. (D) No therapy as it is self limiting disease
(Ref. Shafer's 4th Ed. /Page No. 740)
According to Shafer's the following lines will prove the answer D is correct one.
"There is no specific treatment for this disease. The various antibiotics have been used without great success. Bed rest and adequate diet are probably of as great a benefit as anyother form of therapy. The disease generally runs its course in two to four weeks and there seldom are complications'

54. The most common site of oral cancer among Indian population is:
A. Tongue B. Floor of mouth
C. Alveolobuccal complex D. Lip
Ans. 54. Answer is: C- Alveolobluccal complex
(Ref.ASI/ Page No. 348)
According to the textbook of surgery by Association of surgeons of India various cancers of oral cavity are reported with following frequency

Buccal inucosa	-	38%
Anterior tongue	-	16%
Lower alveolus	-	15.7%

Thus the Alveolobuccal complex accounts for 53.7% of oral cancers is therefore the commonest site of carcinoma in India population.
Note: Incidence of oral carcinoma in foreign populations this is according Ackerman's textbook on surgical pathology 8th Ed/page 243

Lip	45%
Tongue	16%
Floor of mouth	12%
Lower gingiva	12%
Upper gingival	12%
Alveolobuccal Complex	10%
Hard Palate	5%

Because the question specifically asks the incidence of oral cancer in "*Indian populations*" the answer of choice should be *Alveolobuccal complex.*
If this question is asked as a general question the most common site would be **lip**.

ORAL RADIOLOGY

55. The minimum distance used between film, object and target during radiography is:
A. Four feet B. Five feet C. Six feet D. Seven feet
Ans. 55. (B) Five feet
(Ref. Bhalaji 3rd Ed. /Pgl45. White and pharaoh 4th Ed. /Pg 95)

"The distance between the X-ray source and the mid-sagittal plane of the patient is Fixed at **5 feet (152.4cm)**" - Bhalaji 3rd Ed/Pg 145.
"For Cephalometric applications the distance should he *152.4 cm (60 inches or 5 feet)* between the X-ray source and the mid-coronal plane of the patient."

56. The normal percentage of enlargement or magnification considered normal in cephalogram is:
A 1-2% B. 6-7% C. 10-13% D. 14-16%
Ans. 56. (B) 6-7%: A magnification of **5 - 7% is considered normal**. This question has been directly taken from question and answer series of National boards.
This question has also been asked in PGI - 05

ORAL SURGERY

57. "Syncope" occurs while operative processes due to:
A. Cerebral edema B. Cerebral hyperemia
C. Cerebral hypoxia D. Cerebral degeneration
Ans. 57. (C) Cerebral hypoxia
(Ref. Davidson's- 18th Ed./225, Ref. Monheims- 7th Ed. /238)
- **Cerebral syncope** is caused by a sudden drop in cardiac output and cerebral perfusion due to an arrhythmia or a mechanial problem.
- Inappropriate Vasodilatation also causes symptoms by reducing cerebral perfusion"- (Davidson 18th Ed. 225)
- Syncope or fainting is perhaps the most frequently complication associated with local anesthesia in the dental office.
- This is a form of neurogenic shock and is cause by cerebral ischemia secondary to vasodilatation or an increase in the peripheral vascular bed, with a corresponding drop in blood pressure -(Monheims 7th Ed. / 238)

58. The straw colored proteinaceous fluid present in odontogenic keratocyst contains protein:
A. Less than 3.5 gm/dl B. More than 3.5 gm/dl
C. Less than 3.5 mg/dl D. More than 3.5 mg/dl
Ans. 58. (A) Less than 3.5 gm/dl *(Ref. Neelima Malik- Ist Ed/404)*
Cystic contents (aspirate) of odontogenic keratocyst.
- Odontogenic keratocyst contain a dirty white viscoid suspension of keratin, which has an appearance of pus, but without an offensive smell.
- The smear should be stained and examined for keratin cells.
- Electrophoresis will reveal low protein content which is mostly albumin.
- ***Total protein will be found to be below 4gm/100ml***

Important points to remember regarding odontogenic keratocyst.
- OKC has a pronounced tendency to recur. The recurrence rate may vary from **5 to 62%** with most recurrence occurring in the first 5 years.
- Possible reasons reported for this feature are as follows:

(a) Tendency to multiplicity
(b) Presence of satellite cysts
(c) Cystic lining is very thin and fragile, portions of which may be left behind during cyst removal.
(d) Epithelial lining have an intrinsic growth potential
(e) Cysts can arise from basal cells of; the oral mucosa.
(f) Patients with nevoid basal cell carcinoma syndrome have a particular tendency to form multiple primordial cysts.
- **Carnoy's solution** is proposed to be a more conservative approach to large keratocyst by treatment with enucleation.

59. Which of the following is used in the management of hemophilic patient?
A. Tranexamic acid B. Acetic acid C. Ascorbic acid D. Palmitoic acid
Ans. 59. (A) Tranexamic acid
(Ref. Neelima Malik 1st Ed. /681)
Treatment of Hemophilic patients for surgical procedures.
- The recommended level of replacement therapy of *factor VIII varies from 30 to 75%*
- For extensive surgical procedures, the levels of factor should *be raised to 50 to 75%*
- Each unit of factor VIII transfused is estimated to raise Factor *VIII levels 2% per kg of body weight.*
- Local haemostatic measures such as application of topical thrombin, surgical or gel foam is indicated
- ***Stabilization of clot with anti-fibrinolytic drugs such as epsilon-aminocaproic acid (EACA) and tranexamic acid (5%) mouthwash 4 to 6 times daily is indicated***
- Aspirin is contraindicated as they alter ptatelet function.

Thus the answer Tranexamic acid is correct.
Tranexamic acid is more potent and longer acting anti-Fibrinolytic drug. It is available as both oral and parenteral forms, *Intravenous dose is 10 gm/kg body weight the dose being repeated 4 to 6 hourly. It can be used as 5 % mouthwash (500 mg tablet dissolved in 10ml of water) and this solution can be swallowed.*

60. Which of the following is correct reason of facial nerve injury during forceps delivery in labour :
A. The mastoid process is absent at birth
B. The parotid glands is in developing stage
C. The beak of the forceps engages the main trunk of facial nerve.
D. The sublingual hematoma during delivery causes neuropraxia.

Ans. 60. (A) The mastoid process is absent at birth (*Ref: Dutta- Obs and Gynecology-5th Ed. /591)*
"**Mastoid process starts developing after two years of birth** so the facial nerve remains unprotected after it exits from stylomastoid foramen. It is involved by direct pressure of forceps blade or by hemorrhage and edema around the nerve"
This makes it clear that the reason of facial nerve injury during forceps delivery in labour is due to the absence of mastoid process at birth.

PERIODONTICS

61. The first instrument used on the facial surfaces of gingiva while gingivectomy is:
A. Orban's Knife B. Kirkland Knife
C. BP blade with no. II blade D. BP blade with no.12 blade
Ans. 61. (B) Kirkland Knife *(Ref.-Carranza 9th Ed./ 749*)
Surgical gingivectomy
Step 1: The pocket of each surface is explored with a periodontal probe and market with a pocket marker- Crane Kaplan.
Step 2 :***Periodontal knives (e.g. Kirkland knives) are used for incisions on the facial and lingual surfaces*** and those to distal to the terminal tooth in the arch.
• Orbans periodontal knives are used for supplemental interdental incisions, if necessary.
• And Bard Parker knives 11 and 12 and scissors are used as auxiliary instruments.
Thus the first instrument used in gingivectomy procedure is *Periodontal probe* and *Pocker marker* but as it is not given in the options provided the answer is "***Kirkland knife"***
Other important points to remember:
- The gingivectomy incision is started apical to points marking the course of pockets.
- It is directed coronally to a point between base of the pocket and crest of bone.
- The incision should be beveled at approximately **45 degree** to the tooth surface and should recreate normal festooned pattern of the gingiva.
- Failure of bevel leaves a broad, fibrous plateau that take more time than ordinarily required to heal.

62. Oral prophylaxis is contraindicated in:
A. Pre-pubertal gingivitis B. Pregnancy gingivitis
C. Ulcerative refractory gingivitis D. Leukemic gingivitis
Ans. 62. (D) > (C)
(Ref. Carranza 9th Ed)
There is a confusion between the answer (C) ulcerative refractory gingivitis and (D) leukemic gingivitis go through the following lines from the book.
Treatment of ANUG- First visit: Pg. 623
• During initial visit cotton pellet is used in sweeping motion over large areas to remove debris. The area is cleaned with warm water, the superficial calculus is removed with ultrasonic scaler.
"***Subgingival scaling and curettage are contra indicated at this time because of possibility of extending the infection to deeper tissues and also of causing a hacteraemia"***
• "Gingival hemorrhage is a common finding in leukemic patients due to thrombocytopenia"— page 216
• "Granulocytopenia resulting from the replacement of bone marrow cells by leukemic cells reduces the tissue resistance to opportunistic micro organisms and leads to ulceration and infections"- page 217
• ***"Periodantal debridement (scaling and root planning) should be performed and thorough oral hygiene instructions given if the patients' condition allows"*** -page 545.
• From the above text it is clear that oral prophylaxis is a difficulty in initial stage of ulcerative refractive gingivitis but only subgingival scaling is contra indicated and in leukemic gingivitis due to thrombocytopenia and granulocytopenia scaling will be a difficulty and also the lines on page 545 state that oral prophylaxis should be done only if patient condition allows. So we will go in favour of leukemia gingivitis
• Oral prophylaxis can be performed in pre-pubertal gingivitis and pregnancy gingivitis and is the only initial treatment for this.
You can search further for answer of this question on your own. But in my opinion it should by *leukemic gingivitis* only.

63. Which of the following is used as a biodegradable membrane in "guided tissue regeneration" process?
A. Polylactic acid B. Polytetrafluroethylene C. Millipore D. Core membrane
Ans. 63. (A) Polylactic acid
(Ref. Curranza 9th Ed. /809. 810)
Biodegradable membrane used in GTR
- Rat collagen
- Bovine Collagen
- Cartilage membrane
- *Polylactic acid*
- Vycril (Polyglactic - 910)
- *Synthetic Skin (Biobrane)**
- Freeze-dried duramater
- Osseo quest
- Gore Co. (Polyglycolic acid, Polylactic acid)
- Trimethylene carbonate
- Bioguide
- Osteohealth co. (Bi-layer, porcine-derived collagen)

- Astrisorb
- Block drug Co. (Prolactic acid gel)
- Bio mend etc

Thus the answer is Polylactic acid

Please go through the other Biodegradable membrane and non degradable membranes used in GTR, questions may be asked on this topic again.

64. Which of the following immunoglobulin is present in higher concentration in gingival crevicular fluid?

A. Ig A B.Ig G C. Ig E D. Ig M

Ans. 64. (B) Ig G. *(Ref. Carranza 9th ED./259)* "Salvia, like GCF, contains antibodies that are reactive with indigenous oral bacterial species. Although Immunoglobulin found in salvia is Immunoglobulin A (IgA). **However IgG is more prevalent in GCF"**

65. Trauma from occlusion causes:

A. Periodontitis B. Gingivitis

C. Periodontal pocket D. Widening of periodontal ligament.

Ans. 65. (D) Widening of periodontal ligament. *(Ref. Carranza 9th Ed. /377)*

Clinical and Radiographic signs of trauma from occlusion alone:

Clinical signs:

• The most common clinical sign of trauma from occlusion is ***increased tooth mobility due to destruction of periodontal fibres.***

• In final stage, the accommodation of the periodontium to increased forces entails **widening of periodontal ligament** which also leads to increased tooth mobility.

Radiographic Signs:

• Increased width of periodontal ligament space often with thickening of the lamina dura*

• A "vertical" rather that "horizontal" destruction of the interdental septum.*

• Radiolucency and condensation of alveolar bone.*

• Root resorption.*

66. The local drug delivery system "ELYZOL" contains:

A. Metronidazole B. Penicillin C. Sanguinarine D. Tetracycline

Ans. 66. (A) Metronidazole *(Ref: Carranza 9th Ed. /683)* Table No. 50 - 3: Currently available or investigational, locally delivered antimicrobials for periodontal therapy:

Product	**Antimicrobial agent**
Actisite	Tetracycline
Aresite	Minocycline
Atridox	Doxycycline
Dentamycin, Periocline	Minocycline
Elyzol	Metronidazole
Periochip	Chlorhexidine

PROSTHODONTICS:

67. The relationship of the denture base that resists dislodgement of denture in horizontal direction is:

A. Stability B. Pressure C. Support D. Retention

Ans. 67. (A) Stability *(Ref. Boucher's 10th Ed. / 16V. Nallaswamy Ist Ed. /64)*

Let's discuss each option separately:

A. Stability:

Stability refers especially to the ability of denture to ***resist horizontal forces*** that tend to alter the relationship between the denture base and its supporting foundation in a ***horizontal or rotatory direction.***.

B. Pressure:

Atmospheric pressure is the factor for Retention of denture.

It is also called as the Emergency retentive force.

C. Support: Support is defined as "***The resistance to vertical forces of mastication,*** **oclusal forces and other forces applied in a direction towards the denture bearing area."**

D. Retention:

"The quality inherent in the prosthesis which resists the force of gravity, adhesivenes of food, and the forces associated with the opening of the jaws" – GPT So as per the definitions given above the answer ***stability*** is certain.

68. Relining of complete denture is not indicated when:

A. Denture contains broken teeth

B. There is excessive resorption of the ridge

C. Vertical dimension is excessively reduced and has to be changed

D. Centric relation does not coincide with centric occlusion

Ans. 68. (C) Vertical dimension is excessively reduced and has to be changed *(Ref: Nallaswamy/2 38. Boucher 11th Ed. /390)*

Relining

1. Indications

• Immediate dentures after 3 - 6 months where maximum residual ridge resorption would have occurred
• When the adaptation of the dentures to the ridge is poor due to residual ridge resorption
• Economical reasons where the patient cannot afford a new denture
• Geriatric or chronically ill patient who cannot withstand physical and mental stress construction of new dentures.

2. Contraindications
• When the residual ridge has resorbed excessively
• Abused soft tissue due to an ill -fitting denture
• Temporo-Mandibular joint problems
• Patient dissatisfied with the appearance of the existing denture
• Dentures causing major speech problems
• Severe osseous undercuts
The above text makes it clear that answer C. is the correct one. The following lines from Boucher's 11th Ed/ page 390 are given in support of the answer
"When minimal or moderate changes are evident, it (relining) is the treatment of choice."
If extensive changes in vertical dimensions are encountered then simultaneous refitting or impression surface of denture with re-orienting of its vertical and horizontal position in mouth required and this is done by procedure called **Rebasing.**

69. The most suitable margin design for all ceramic restoration is:
A. Shoulder B. Chamfer
C. Shoulder with bevel D. Depends upon operators choice
Ans. 69. Answer is: A- Shoulder *(Ref. Shillingburg- 3rd Ed. / 132)*

Finish Lines	Indications
1. Shoulder	All ceramics crowns, Porcelain fused to metal crowns, Injectable porcelains.
2. Shoulder with bevel	Proximal boxes of onlays and inlays. Labial finish line of metal ceramics, Occlusal shoulder of onlays.
3. Chamfer	Cast metal restoration, Lingual aspect of metal ceramics
4. Knife edge	Young patients, MOD onlay, Inaccessible areas, Finish lines in cementum.

70. In fixed partial denture it is better for posterior pontic to avoid contacts in:
A. Working side contacts B. Balancing side Contacts
C. Side to side contact D. Centric occlusion
Ans. 70. (B) Balancing side Contacts *(Ref: Tylman 8thEd /363)*
"In FPD, it is better for posterior pontic to avoid balancing side contacts"*
"In FPD the balancing side contacts were eliminated on posterior teeth" –Nallaswamy page 532.
• In FPD it is better for posterior pontic to avoid contacts in balancing side
• Centric relation is most reproducible relation of the jaws that is used in FPD construction.
• In centric relation deflective contacts are corrected first.*
• A cusp should be reduced if it is deflective in centric and eccentric position
• BULL *technique* is used to reduce the cusps when interference is on working side contacts of Laterotrusive contacts
• When mandible is closed shut forcibly from a opening movement, the position achieved by it is called **centric occlusion.**

Deflective contacts	Occlusal correction
Posterior Teeth	
- Deflective contact is only in centric	Reduce the fossa or marginal ridge relation
- Deflective contact in both centric and eccentric position	Reduce both fossa and cusp
Anterior Teeth	
- When the incisal edge of lower anteriors touch the upper lingual fossa in centric edges of lower teeth.	Reduce the incisal edges of lower teeth.
- Incisal edge of lower anteriors touching upper teeth in both centric and eccentric relations.	Deepen the lingual fossa of fossa of upper teeth and reduce lower incisal edges.

71. The pontic design of choice in the appearance zone of maxillary and mandibular bridge:
A. Hygienic B. Modified ridge lap C. Saddle D. Conical
Ans 71 (B) Modified ridge lap *(Ref. Nallaswamy 1st Ed./Pg 510, Ref. Tylman 8th Ed. /Pg 360)*
In the mandibular anterior region when there is *minimal bone loss* and esthetics are involved **modified ridge lap** is the preferable design, when there is *extensive bone* loss **modified ridge lap with no embrasures is preferable design.**
Saddle pontic:
- The concave gingival surface overlaps the ridge buccally and lingually.
- The gingival surface will not have continuous contact, only the buccal and lingual end gingival surface will contact the tissue of ridge.
- It is the least hygienic pontic.

Ridge Lap pontic:
- It resembles natural tooth.
- Designed to adapt closely to the ridge.
- Satisfies esthetic but not hygiene.
- Difficult to maintain, often leads to inflammation of the tissues in contact.

Conical Pontic:
- It is designed for insertion into the alveolar socket immediately after extraction.
- It promotes ridge resorption and results in an uncleansible area.

Modified ridge lap pontic:
- Designed to reduce tissue contact.
- Satisfies both aesthetic & hygiene.
- Tissue contact limited to buccal surface of the ridge.
- Has *'T' shaped contact*- Vertical arm of T ends in crest of the ridge and horizontal arm forms contact on buccal surface of ridge.
- Recommended in maxillary anterior and posterior regions

Spheroidal pontic:
- Pontic contacts the tip of the ridge or buccal surface without pressure. Does not have concave gingival surface.
- *Design of choice in mandibular posterior region where aesthetics is not major concern*

Sanitary or hygienic or fish-belly pontics:
- These pontics have zero tissue contact.
- Easy to maintain but highly unaesthetic.
- At least 3mm of vertical gap must be present between Pontic and the ridge.
- Recommended in mandibular posterior areas.

OPERATIVE DENTISTRY

72. The pin used in pin restoration of a root canal treated tooth is:
A. Self threaded pin B. Cemented pin
C. Frictional pin D. Any of the above
Ans. 72. (B) Cemented pin *(Ref: Sturdevant- 2ndEd. /Page. 373.)*
"**Because the cemented pin does not produce internal stress and craze lines in the dentin, it is the pin of choice for use in the restoration of root canal treated teeth**."
Types of pins are *cemented, friction locked and self threading pins*.
The diameters and extensions of pins have been discussed elsewhere. Here we present a few other points:
Retention of pins in ascending order:
Cemented pin < Friction locked pins < self threading pins
Pulpal Stress:
Self threading pin > friction locked pins > cemented
- TMS (Thread mate System) is the most widely used self threading pin.
- TMS pin sizes *
- Minikin - 0.48 mm (0.019 inch)
- Minuta - 0.38 mm (0.015 inch)
- Minim - 0.61 mm (0.024 inch)
- Pin extension into dentin and amalgam greater than 2 mm is unnecessary for pin retention and is contraindicated to preserve the strength of the dentin and amalgam(AIPG-2007)

Questions regarding pin retained restoration are frequently asked in All India examination. So please go through the whole chapter on this in Sturtevant 4th and 5th edition.

ENDODONTICS

73. Which of the following is not responsible for endogenous staining of teeth during development?
A. Tetracycline B. Rh incompatibility
C. Neonatal liver disease D. Vitamin C deficiency
Ans. 73. (D) Vitamin C deficiency *(Ref. Grossman 11th Ed. /271)*
Cause of tooth discoloration:
1. Local causes
- Decomposition of pulp tissue
- Excessive hemorrhage following pulp removal
- Trauma
- Medicaments
- Filling materials

2. Systemic causes
(a) Congenital porphyria — Red or purple discoloration

(b) Hereditary opalescent dentin	Violaceous
(c) Endemic flourosis	Mottled brown
(d) **Erythroblastosis fetalis** (Rh incompatibility)	Grayish brown
(e) **Jaundice** (Liver disease)	Brown
(f) **Tetracycline** (Irreversible discoloration)	ellow to gray or brown

As all the other options given in the question cause tooth discoloration other than Vitamin C deficiency, it is the answer of choice.

74. Difference between physical characteristics of reamers and files is:
A. The cross-section of reamers is square and files are triangular in cross section.
B. The numbers of flutes on the blade are more in files than in reamers.
C. The reamers have more flutes in the blade.
D. Files have two superficial grooves to produce flutes in a double helix design.
Ans. 74. (B) The numbers of flutes on the blade are more in files than in reamers. *(Ref: Grossman 11th Ed/ 195)*

75. The Buckley's solution is composed of:
A. Cresol, formaldehyde, water and glycerin B. Formaldehyde, resorcinol, water
C. Iodoform, glutaraldehyde, ZOE D. Chloraldehyde, parachloral, methanol water
Ans. 75. (A) Cresol, formaldehyde, water and glycerin
(Ref: Shoba Tandon –11thEd/Pg 342*)*
Buckley's formula of formocresol used today is *1/5 concentration i.e. 20% formocresol*
Its composition is:
• Cresol 35%
• Formaldehyde 19%
• Water glycerin 15%
• Formocresol pulpotomy technique was first advocated by **Sweet (1930)**
• The proposed action of formaldehyde is that it prevents tissue autolysis by binding to protein.

ORTHODONTICS

76. A dentist did restorative procedure in a 11 year old child and found the primary molar are in various stages of exfoliation and there is slight anterior crowding present between the anterior teeth. The dentist should give his next appointment:
A. After three months for observation B. After six months for recall checkup
C. After one year D. When all the permanent teeth will erupt
Ans. 76. (A) After three months for observation *(Ref: National boards series-Q. no. 16, March 1980 paper)*
Friends this question has been taken from National boards question set directly. I have gone through many textbooks and it is very difficult to find correct reference for the above question. So don't waste your time in searching for answer.
The answer given is certainly true as this question has been directly taken from the given reference.

77. The rectangular wire used in edgewise appliance in primarily meant for:
A. Correction of crown root position B. Increasing the strength of wire
C. Correction of Arch-length Deficiency D. Used for correction of anterior crowding
Ans. 77. (A) Correction of crown root position *(Ref. Proffit- 2nd Ed/Pg 343)*
Edgewise : "To overcome the deficiencies of the ribbon arch, Angle reoriented the slot from *vertical to horizontal* and inserted a *rectangular wire* rotated 90 degrees to the orientation it had with the ribbon arch-thus the name "**edgewise".**
The dimensions of the slot were altered to 22 X 28 *mils*, and a 22 X 28 precious metal wire was used. These dimensions were arrived at after extensive experimentation and allowed excellent control of crown and root position in all three planes of space. (PGI-Dec'05)
The text given above makes it clear that answer is (A) correction of crown root position.
• E-arch was Angles first appliance and had limitation of delivering only heavy interrupted forces.
• Only tipping teeth to new position was accomplished with E-arch.
• It was not able to precisely position any individual tooth and pin and tube was developed.
• Angles next appliance was Ribbon arch it was an immediate success primarily because of arch wire.
• The major weakness of Ribbon arch was that it provided relatively poor control root position and edgewise appliance was developed.

78. The buccal coil spring is used to regain the space present between first premolar and first molar. What is the most common complication post treatment?
A. Pain B. Gingival irritation
C. Tendency for the 1st molar to intrude D. Tendency for the 1st premolar to rotate
Ans. 78. (D) Tendency for the 1st premolar to rotate
(Ref: National boards series-Q. no.2, March 1980 paper)
I have searched through Bhalaji, Gurkeerat Singh, S. Bishara, M.S.Rani and Profit but I did not get a line quoting the answer for this question.
Please help me out for its reference. But the answer is absolutely correct.

79. The arch space for eruption of permanent second and third molar is created by:
A. Apposition of alveolar process B. Resorption of posterior border of Ramus
C. Resorption of anterior border of Ramus. D. Apposition of lower body of mandible.
Ans. 79. (C) Resorption of anterior border of Ramus.

(Ref. Bhalajhi 3rd Ed/ Pg 33)
Post natal growth of Ramus of mandible:
• The ramus moves progressively posterior by a combination of deposition and resorption.
• ***Resorption occurs on the anterior part of the ramus while bone deposition occurs on the posterior region. This results in a 'drift' of the ramus in a posterior direction***.
The functions of remodeling of the ramus are:
• To accommodate the increasing mass of masticatory muscles inserted into it.
• To accommodate the enlarged breadth of the pharyngeal space.
• ***To facilitate the lengthening of the mandibular body which is turn accommodates the erupting molars.***

80. The ANB angle of 2 degree usually indicates:
A. A favorable relationship of maxillary alveolar base to Mandibular alveolar base
B. A favorable relationship of mandible to cranium.
C. Poor cranial growth
D. Upright incisors
Ans. 80. (A) It is normal angle and represents relationship of alveolar process of mandible
(Ref: Bhalajhi- 3rd Ed/ 154, National hoards series-Q no.23, March 1980 paper)
A.N.B angle
This angle is formed by the intersection of lines joining nasion to point A and nasion to point B
• It denotes the relative position of the maxilla and mandible to each other
• The mean value is 2°.
• An increase in this angle is indicative of a class II skeletal tendency while an angle that is less than normal or a negative angle is suggestive of a skeletal class III relationship.
S.N.B: 80°- option B) Normal angle which represents relationship of mandible to cranium.
S.N.A: 82°- option C) Normal angle which represents relationship of maxilla to cranium.
Basion-Nasion plane - option D) Represents the length of cranial base.
For a comprehensive review of Cephalometrics read Q. no.85 in MHPGDCET'06

81. Superposition in cephalometric studies is done from "registration point" This best demonstrates:
A. Growth of structure farthest from point B. Growth of structure nearest to point.
C. Growth at that point D. All of the above
Ans. 81. (A) Growth of structure farthest from point.
(Ref. Bhulajhi 3rd Ed/Pg 148)
Broadbent registration point is the midpoint of the perpendicular from the center of sella turcica to the Bolton's plane.
Super imposition in cephalometric studies is done from "registration point" and it demon strates ***growth of structures farthest from the paint***.

82. When a maxillary removable orthodontic appliance is first placed, the effect on the patient's speech will probably include:
A. Difficulty with lingual vowels for a few days.
B. Difficulty with lingual vowel for several weeks.
C. Difficulty with linguoalveolar consonants for a few days.
D. Difficulty with linguoalveolar consonants for several weeks.
Ans. 82. (C) Difficulty with linguoalveolar consonants for a few days.
(Ref: National boards series-Q. no.24, March 1980 paper)
When a new appliance is place initially the patient will have difficulty in speech involving linguoalveolar consonants like t. d etc. This problem gets corrected with time and exercise.
This question has been directly put up form National boards so don't waste time in searching for references.
I would suggest you people to read National boards series properly. It has been a standard question bank for AIIMS & AIPG for many years. This ones a great example, 4-5 questions directly asked from one paper only!!!

83. During smile a pleasure carve is formed following the curve of anterior teeth and some portion of mesial surfaces of each tooth is visible. How much percentage of mesial surface teeth is visible during smiling or "Golden Esthetic Rule" is:
A. 50% B. 60% C. 70% D. 80%
Ans. 83. (B) 60%
(Ref. Sturdevant- 4th Ed/Pg 596)
In addition to being symmetric, anterior teeth must be in proper proportion to one another to achieve maximum esthetics.
However one long accepted theorem of relative proportionality of maxillary anterior teeth typically visible in a smile involves the concept of the "***golden proportion***".
• Originally formulated as one of ***Euclid's formula*** it has been relied upon through the ages as a geometric basis for proportionality in the beauty of art and nature.
• Based on this formula a smile, when viewed from the front, is considered as aesthetically pleasing if each tooth in that smile (starting from midline) is **approximately 60% of the size of the tooth immediately mesial to it**.
• The exact proportion of the smaller tooth is **0.618**.
• It must be emphasized that these proportions are based on the apparent sizes of the teeth when viewed straight on and not the actual sizes of the individual teeth.
• An accepted theorem for achieving esthetically pleasing central incisors maintains that the ideal width to length ratio should be **0.75: 0.8.** This ratio represents the ideal proportion needed to optimize the esthetic result.

84. Cephalometric analysis are used to evaluate growth changes by superimposing on:
A. Sella-nasion plane B. Mandibular plane
C. F-H plane D. Occlusal plane
Ans. 84. (A) Sella-nasion plane
(Ref. Proffit- 2nd Ed/Pg 174)
"**Sella-nasion plane/SN plane** represents the anterior cranial base. The growth of anterior cranial base is completed much earlier compared to facial structures so the SN plane is taken as most stable area to compare the growth changes of facial structure and jaws"
The following lines form Proffit will explain the answer:
Cranial base superimposition, allows the relationship of maxilla and mandible to the cranium to be evaluated. ***In general the most useful approach is to superimpose on the SNP line***, registering the template over the patients tracing at nasion rather than sella if there is difference in cranial base length.
Mandibular plane: Several Mandibular planes are used in Cephalometrics, based on the analysis being done. The most commonly used ones are:
• Tangent to the lower border of the mandible (Tweed)
• A line connecting gonion and gnathion (Steiner)
• A line connecting gonion and menton (Downs)
F-H plane: This plane connects the lowest point of the orbit (orbitale) and the superior point of the external auditory meatus (porion)
Occlusal plane: It is a dental plane bisecting the posterior occlusion of the permanent molars and premolar (or deciduous molars in mixed dentition) and extends anteriorly.

PEDODONTICS

85. The pulse-oxymetry is used in the determination of:
A. Rate of flow B. Oxygen saturation
C. Blood Volume D. Blood coefficient
Ans. 85. (B) Oxygen saturation
(Ref: Shohha Tandon 1st Ed/Pg 338)
• A direct measurement of pulp circulation is the only real measure of pulp vitality.
• Pulse-oxymetry is a completely objective test requiring no subjective response from the patient that directly measures blood oxygen saturation levels
  • To determine oxygen saturation, the pulse-oxymeter measures and compares amplitudes of the ratios of transmitted infra-red light with red light.
• The ratio varies with relative fractions of oxygen saturated to unsaturated hemoglobin and used to calculate oxygen saturation.
• These characteristics infer that the pulse oximeter is also capable of evaluating the blood vasculature status within a tooth and therefore pulp vitality.
• The dependence on a pulsatile blood flow appears to be a disadvantage of the use of the pulse oximeter.
• The laser Doppler flow meter measures the velocity of red blood cells in capillaries is a noninvasive objective painless alternative to traditional neural stimulation method.
Dual wavelength spectrometry:
This measures blood oxygenation change within the capillary bed of dental tissue and thus not dependent on a pulsatile blood flow.
Hughes's probe eye camera:
This is used in detecting temperature changes as small as O.I C, hence been used to measure pulp vitality experimentally.

86. The "Stainless Steel Crown" is invented by:
A. Humphrey B. Willet C. Cvek D. Addleston
Ans. 86. (A) Humphrey
(Ref. Shobha Tandon,1stEd-Reprint/314)
- Stainless steel crown was introduced by **Humphrey** in 1950.
- **Willet** - 1st developed distal shoe space maintainer (AIPG - 2006)
- **Cvek** - Developed the technique of partial pulpotomy (AIPG - 2006)
- **Addleston** - Tell show do technique of Behavior management.
Thus the answer is (A) Humphrey

Scientists in Pedodontics:

Rampant Canes	Massler
Early childhood canes	Davis
Nursing caries	Winter et al
Nursing bottle caries	Jacobi
Acidogenic theory	Miller
Psychoanalytic theory	Singmond Freud
Psychosocial theory	Eric Erickson
Cognitive theory	Jean Piaget
Hierarchy of needs	Massler
Social learning theory	Bandura
Classical conditioning theory	Pavlow
Operant conditioning theory	Skinner
Modelling	Bandura

Home – technique Evangeline Jordan

Classification of occlusion

For primary teeth	Baume
Caries triad	Keyes
Caries tetrad	Newburn
Prophylactic odontomy	Hyatt
Fissure eradication	Bodecker
Acid etching	Buonocore
BIS - GMA resin	Bowen
Father of serial extraction	Nance
Calcium hydroxide	Herman

87. The non-invasive method to measure the blood flow is:

A. Electric pulp test B. Percussion
C. Radiograph D. Laser Doppler flowmetry

Ans. 87. (D) Laser Doppler flowmetry (Ref. Shobha Tandon, 1st Ed/332*)*

Low Doppler Flowmetry

- The **laser Doppler flowmetry**, developed in the **1970** to measure *the velocity of red* blood *cells in capillaries*, is a non invasive, objective, painless alternative to traditional neural stimulation methods and therefore a promising test for young children.
- The flowmeter produced regular signal fluctuations for vital teeth. Non-vital teeth showed no such synchronous signal but produced irregular fluctuations of very steep spike traces that were attributed to a movement artifact. **This instrument has demonstrated its value for ongoing assessment of post-traumatized permanent incisors.**

88. The KRI paste is composed of:

A. Iodoform, camphor, parachlorophenol and menthol
B. Iodoform and ZOE
C. Parachlorophenol, camphor and menthol
D. Calcium hydroxide and Iodoform.

Ans. 88. (A) Iodoform, camphor, parachlorophenol and menthol

(Ref. Shobha Tondon, 1stEd/354 - Table No. 8: II)

- Walkhoff paste: parachlorophenol. Camphor. Menthol.
- KRI paste: lodoform, Camphor, parachlorophenol, menthol.
- Maisto: Zinc oxide, Iodoform, thymol, chlorophenol, camphor, lanolin.
- Vitapex: Calcium hydroxide, iodoform, oily additives.

89. While fabricating bilateral distal shoe appliance for maintaining space lost by primary molar, the first factor considered is:

A. Tooth anatomy B. Load of distribution
C. Flexibility of wire D. Space present posterior to permanent

Ans. 89. (B) Load of distribution

Still searching for the proper reference.

- Logically tooth anatomy will not have any bearing on bilateral distal appliance.
- Flexibility of wire is not a factor in distal shoe appliance fabrication.
- Space present posterior to permanent first molar will not cause any change in fabrication of bilateral distal shoe appliances

So the obvious answer appears to (B) Load of distribution.

90. The distribution of dental caries in the best described by:

A. Descriptive and analytical study
B. Descriptive and experimental study
C. Descriptive, analytical and experimental study
D. Analytical and experimental study

Ans. 90. (A) Descriptive and analytical study

(Ref: Soben Peter 2nd Ed/page 92)

"**A descriptive study** is one that attempts to do no more than describe the pattern of occurrence of a disease or a condition relative to other characteristics of the population.

For example a study conducted for measuring the degree of dental caries in a school district relative to the age, sex and socio-economic characteristics of the children."

Descriptive studies are usually the first phase of any epidemiological investigation.

Discovering the cause of the disease and the ways in which these could be modified comprises under analytical study.

Analytical study starts with the exposure and proceed till disease is produced or start with the disease and travel back is time till one reaches the point of exposure.

So the answer is definitely descriptive and analytical study no doubt about it.