

# COMMON ENTRANCE TEST - 2011

DATE	SUBJECT	TIME
28-04-2011	PHYSICS	10.30 AM to 11.50 AM

MAXIMUM MARKS	TOTAL DURATION	MAXIMUM TIME FOR ANSWERING
60	80 MINUTES	70 MINUTES

MENTION YOUR CET NUMBER	QUESTION BOOKLET DETAILS	
	VERSION CODE	SERIAL NUMBER
	<b>A - 1</b>	<b>538497</b>

**DOs :**

1. Check whether the CET No. has been entered and shaded in the respective circles on the OMR answer sheet.
2. This Question Booklet is issued to you by the Invigilator after the **2<sup>nd</sup> Bell**, i.e., after **10.30 a.m.**
3. The Serial Number of this question booklet should be entered on the OMR answer sheet.
4. The Version Code of this question booklet should be entered on the OMR answer sheet and the respective circles should be shaded completely.
5. Compulsory sign at the bottom portion of the OMR answer sheet in the space provided.

**DON'Ts :**

1. **The timing and marks printed on the OMR answer sheet should not be damaged/mutilated/spoiled.**
2. The **3<sup>rd</sup> Bell** rings at **10.40 a.m.** till then;
  - Do not remove the seal/staple present on the right hand side of this question booklet.
  - Do not look inside this question booklet.
  - Do not start answering on the OMR answer sheet.

### IMPORTANT INSTRUCTIONS TO CANDIDATES

1. This question booklet contains 60 questions and each question will have one statement and four distracters (four different options / choices).
2. After the **3<sup>rd</sup> Bell** is rung at **10.40 a.m.**, remove the seal/staple present on the right hand side of this question booklet and start answering on the OMR answer sheet.
3. During the subsequent 70 minutes :
  - Read each question carefully.
  - Choose the correct answer from out of the four available distracters (options/choices) given under each question/statement.
  - Completely **darken/shade** the relevant circle with a **BLUE OR BLACK INK BALLPOINT PEN** **against the question number on the OMR answer sheet.**

**CORRECT METHOD OF SHADING THE CIRCLE ON THE OMR SHEET IS AS SHOWN BELOW :**



4. Please note that even a minute unintended ink dot on the OMR sheet will also be recognized and recorded by the scanner. Therefore, avoid multiple markings of any kind on the OMR answer sheet.
5. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
6. After the **last bell** is rung at **11.50 a.m.**, stop writing on the OMR answer sheet and affix your **LEFT HAND THUMB IMPRESSION** on the OMR answer sheet as per the instructions.
7. Hand over the OMR answer sheet to the room Invigilator as it is.
8. After separating and retaining the top sheet (KEA Copy), the Invigilator will return the bottom sheet replica (Candidate's copy) to you to carry home for self-evaluation.
9. Preserve the replica of the OMR answer sheet for a minimum period of **ONE year**.

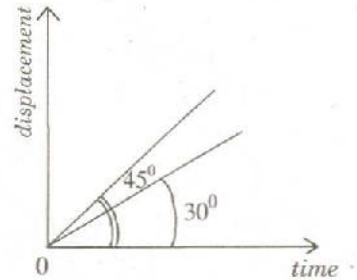
## PHYSICS

1. If  $C$  be the capacitance and  $V$  be the electric potential, then the dimensional formula of  $CV^2$  is .....

- 1)  $M^1 L^2 T^{-2} A^0$                       2)  $M^1 L^1 T^{-2} A^{-1}$   
 3)  $M^0 L^1 T^{-2} A^0$                       4)  $M^1 L^{-3} T^1 A^1$

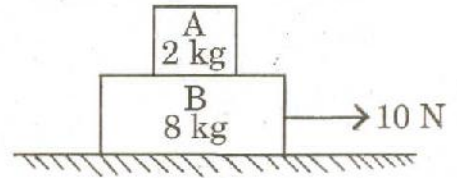
2. The displacement-time graphs of two moving particles make angles of  $30^\circ$  and  $45^\circ$  with the  $X$ -axis. The ratio of their velocities is .....

- 1)  $\sqrt{3} : 2$   
 2)  $1 : 1$   
 3)  $1 : 2$   
 4)  $1 : \sqrt{3}$



3. Block  $A$  of mass  $2 \text{ kg}$  is placed over block  $B$  of mass  $8 \text{ kg}$ . The combination is placed over a rough horizontal surface. Coefficient of friction between  $B$  and the floor is  $0.5$ . Coefficient of friction between  $A$  and  $B$  is  $0.4$ . A horizontal force of  $10 \text{ N}$  is applied on block  $B$ . The force of friction between  $A$  and  $B$  is ..... ( $g = 10 \text{ ms}^{-2}$ ).

- 1)  $100 \text{ N}$   
 2)  $40 \text{ N}$   
 3)  $50 \text{ N}$   
 4) zero



4. The height  $y$  and the distance  $x$  along the horizontal plane of a projectile on a certain planet (with no surrounding atmosphere) are given by  $y = 8t - 5t^2$  meter and  $x = 6t$  meter, where  $t$  is in seconds. The velocity with which the projectile is projected is .....

- 1)  $6 \text{ ms}^{-1}$                                       2)  $8 \text{ ms}^{-1}$   
 3)  $10 \text{ ms}^{-1}$                                     4)  $14 \text{ ms}^{-1}$

5. A body of mass  $5 \text{ kg}$  is thrown vertically up with a kinetic energy of  $490 \text{ J}$ . The height at which the kinetic energy of the body becomes half of the original value is ..... (acceleration due to gravity =  $9.8 \text{ ms}^{-2}$ ).

- 1)  $5 \text{ m}$     2)  $2.5 \text{ m}$   
 3)  $10 \text{ m}$     4)  $12.5 \text{ m}$

(Space for Rough Work)

6. A solid sphere of mass  $m$  rolls down an inclined plane without slipping, starting from rest at the top of an inclined plane. The linear speed of the sphere at the bottom of the inclined plane is  $v$ . The kinetic energy of the sphere at the bottom is .....
- |                      |                       |
|----------------------|-----------------------|
| 1) $\frac{1}{2}mv^2$ | 2) $\frac{5}{3}mv^2$  |
| 3) $\frac{2}{5}mv^2$ | 4) $\frac{7}{10}mv^2$ |
7. Two satellites of mass  $m$  and  $9m$  are orbiting a planet in orbits of radius  $R$ . Their periods of revolution will be in the ratio of .....
- |          |          |
|----------|----------|
| 1) 9 : 1 | 2) 3 : 1 |
| 3) 1 : 1 | 4) 1 : 3 |
8. The following four wires of length  $L$  and radius  $r$  are made of the same material. Which of these will have the largest extension, when the same tension is applied?
- |                               |                               |
|-------------------------------|-------------------------------|
| 1) $L = 100$ cm, $r = 0.2$ mm | 2) $L = 200$ cm, $r = 0.4$ mm |
| 3) $L = 300$ cm, $r = 0.6$ mm | 4) $L = 400$ cm, $r = 0.8$ mm |
9. The resultant of two forces acting at an angle of  $120^\circ$  is 10 kg wt and is perpendicular to one of the forces. That force is .....
- |                       |                                |
|-----------------------|--------------------------------|
| 1) $10\sqrt{3}$ kg wt | 2) $20\sqrt{3}$ kg wt          |
| 3) 10 kg wt           | 4) $\frac{10}{\sqrt{3}}$ kg wt |
10. Eight equal drops of water are falling through air with a steady velocity of  $10 \text{ cm s}^{-1}$ . If the drops combine to form a single drop big in size, then the terminal velocity of this big drop is .....
- |                           |                           |
|---------------------------|---------------------------|
| 1) $40 \text{ cm s}^{-1}$ | 2) $10 \text{ cm s}^{-1}$ |
| 3) $30 \text{ cm s}^{-1}$ | 4) $80 \text{ cm s}^{-1}$ |

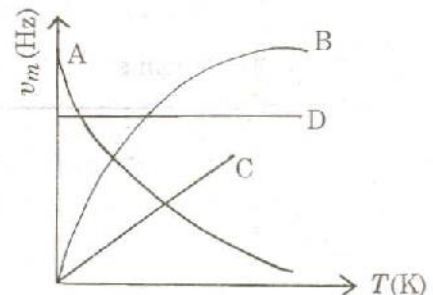
---

(Space for Rough Work)

11. Two capillary tubes of different diameters are dipped in water. The rise of water is .....
- 1) the same in both tubes
  - 2) greater in the tube of larger diameter
  - 3) greater in the tube of smaller diameter
  - 4) independent of the diameter of the tube
12. A perfect gas at  $27^{\circ}\text{C}$  is heated at constant pressure so as to double its volume. The increase in temperature of the gas will be .....
- 1)  $600^{\circ}\text{C}$
  - 2)  $327^{\circ}\text{C}$
  - 3)  $54^{\circ}\text{C}$
  - 4)  $300^{\circ}\text{C}$
13. Three identical rods  $A$ ,  $B$  and  $C$  are placed end to end. A temperature difference is maintained between the free ends of  $A$  and  $C$ . The thermal conductivity of  $B$  is THRICE that of  $C$  and HALF of that of  $A$ . The effective thermal conductivity of the system will be ..... ( $K_A$  is the thermal conductivity of rod  $A$ ).
- 1)  $\frac{1}{3} K_A$
  - 2)  $3 K_A$
  - 3)  $2 K_A$
  - 4)  $\frac{2}{3} K_A$
14. The quantities of heat required to raise the temperatures of two copper spheres of radii  $r_1$  and  $r_2$  ( $r_1 = 1.5 r_2$ ) through  $1 \text{ K}$  are in the ratio of .....
- 1)  $\frac{27}{8}$
  - 2)  $\frac{9}{4}$
  - 3)  $\frac{3}{2}$
  - 4)  $1$

15. Which one of the following is  $\nu_m - T$  graph for perfectly black body?  $\nu_m$  is the frequency of radiation with maximum intensity.  $T$  is the absolute temperature.

- 1) A
- 2) B
- 3) C
- 4) D



(Space for Rough Work)



21. Wavelength of given light waves in air and in a medium are  $6000\text{Å}$  and  $4000\text{Å}$  respectively. The critical angle is .....

- |  |  |
|--|--|
| 1) $\tan^{-1}\left(\frac{2}{3}\right)$ | 2) $\tan^{-1}\left(\frac{3}{2}\right)$ |
| 3) $\sin^{-1}\left(\frac{2}{3}\right)$ | 4) $\sin^{-1}\left(\frac{3}{2}\right)$ |

22. The time required for the light to pass through a glass slab (refractive index = 1.5) of thickness 4 mm is ..... ( $c = 3 \times 10^8 \text{ ms}^{-1}$ , speed of light in free space).

- |                                    |                                    |
|------------------------------------|------------------------------------|
| 1) $10^{-11} \text{ sec}$          | 2) $2 \times 10^{-11} \text{ sec}$ |
| 3) $2 \times 10^{+11} \text{ sec}$ | 4) $2 \times 10^{-5} \text{ sec}$  |

23. A prism having refractive index 1.414 and refracting angle  $30^\circ$  has one of the refracting surfaces silvered. A beam of light incident on the other refracting surface will retrace its path, if the angle of incidence is .....

- |               |               |
|---------------|---------------|
| 1) $0^\circ$  | 2) $30^\circ$ |
| 3) $60^\circ$ | 4) $45^\circ$ |

24. A planoconvex lens has a maximum thickness of 6 cm. When placed on a horizontal table with the curved surface in contact with the table surface, the apparent depth of the bottommost point of the lens is found to be 4 cm. If the lens is inverted such that the plane face of the lens is in contact with the surface of the table, the apparent depth

of the center of the plane face is found to be  $\left(\frac{17}{4}\right)$  cm. The radius of curvature of the lens is .....

- |           |          |
|-----------|----------|
| 1) 68 cm  | 2) 75 cm |
| 3) 128 cm | 4) 34 cm |

25. Two thin lenses have a combined power of +9D. When they are separated by a distance of 20 cm, their equivalent power becomes  $+\frac{27}{5}$  D. Their individual powers (in diopters) are .....

- |         |         |
|---------|---------|
| 1) 1, 8 | 2) 2, 7 |
| 3) 3, 6 | 4) 4, 5 |

---

(Space for Rough Work)

26. Wavefront is the locus of all points, where the particles of the medium vibrate with the same .....
- |              |              |
|--------------|--------------|
| 1) phase     | 2) amplitude |
| 3) frequency | 4) period    |
27. Two monochromatic light waves of amplitudes  $3A$  and  $2A$  interfering at a point have a phase difference of  $60^\circ$ . The intensity at that point will be proportional to .....
- |           |            |
|-----------|------------|
| 1) $5A^2$ | 2) $13A^2$ |
| 3) $7A^2$ | 4) $19A^2$ |
28. Consider the following statements in case of Young's double slit experiment.
- A slit  $S$  is necessary if we use an ordinary extended source of light.
  - A slit  $S$  is not needed if we use an ordinary but well collimated beam of light.
  - A slit  $S$  is not needed if we use a spatially coherent source of light.
- Which of the above statements are correct?
- |                  |              |
|------------------|--------------|
| 1) a), b) and c) | 2) a) and b) |
| 3) b) and c)     | 4) a) and c) |
29. A parallel beam of light of wavelength  $6000 \text{ \AA}$  gets diffracted by a single slit of width  $0.3 \text{ mm}$ . The angular position of the first minima of diffracted light is .....
- |                                     |                                   |
|-------------------------------------|-----------------------------------|
| 1) $2 \times 10^{-3} \text{ rad}$   | 2) $3 \times 10^{-3} \text{ rad}$ |
| 3) $1.8 \times 10^{-3} \text{ rad}$ | 4) $6 \times 10^{-3} \text{ rad}$ |
30. The critical angle of a certain medium is  $\text{Sin}^{-1}\left(\frac{3}{5}\right)$ . The polarizing angle of the medium is .....
- |  |  |
|--|--|
| 1) $\text{Sin}^{-1}\left(\frac{4}{5}\right)$ | 2) $\text{Tan}^{-1}\left(\frac{5}{3}\right)$ |
| 3) $\text{Tan}^{-1}\left(\frac{3}{4}\right)$ | 4) $\text{Tan}^{-1}\left(\frac{4}{3}\right)$ |

---

(Space for Rough Work)

31. Two identical charged spheres of material density  $\rho$ , suspended from the same point by inextensible strings of equal length make an angle  $\theta$  between the strings. When suspended in a liquid of density  $\sigma$  the angle  $\theta$  remains the same. The dielectric constant  $K$  of the liquid is .....

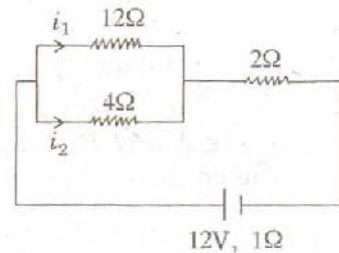
- 1)  $\frac{\rho}{\rho - \sigma}$       2)  $\frac{\rho - \sigma}{\rho}$       3)  $\frac{\rho}{\rho + \sigma}$       4)  $\frac{\rho + \sigma}{\rho}$

32. The electric field at a point due to an electric dipole, on an axis inclined at an angle  $\theta (< 90^\circ)$  to the dipole axis, is perpendicular to the dipole axis, if the angle  $\theta$  is .....

- 1)  $\tan^{-1}(2)$       2)  $\tan^{-1}\left(\frac{1}{2}\right)$       3)  $\tan^{-1}(\sqrt{2})$       4)  $\tan^{-1}\left(\frac{1}{\sqrt{2}}\right)$

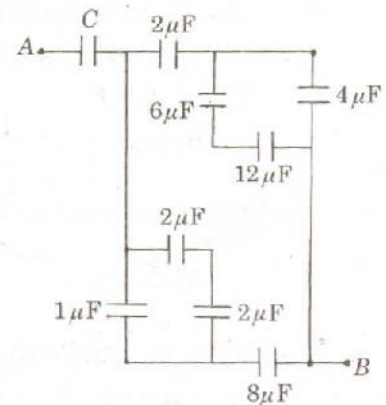
33. In the circuit shown, the currents  $i_1$  and  $i_2$  are .....

- 1)  $i_1 = 1.5 \text{ A}, i_2 = 0.5 \text{ A}$   
 2)  $i_1 = 0.5 \text{ A}, i_2 = 1.5 \text{ A}$   
 3)  $i_1 = 1 \text{ A}, i_2 = 3 \text{ A}$   
 4)  $i_1 = 3 \text{ A}, i_2 = 1 \text{ A}$



34. In the given network, the value of  $C$ , so that an equivalent capacitance between  $A$  and  $B$  is  $3\mu\text{F}$ , is .....

- 1)  $\frac{1}{5} \mu\text{F}$   
 2)  $\frac{31}{5} \mu\text{F}$   
 3)  $48 \mu\text{F}$   
 4)  $36 \mu\text{F}$



35. A conductor wire having  $10^{29}$  free electrons/ $\text{m}^3$  carries a current of 20A. If the cross-section of the wire is  $1\text{mm}^2$ , then the drift velocity of electrons will be ..... ( $e = 1.6 \times 10^{-19} \text{ C}$ ).

- 1)  $1.25 \times 10^{-4} \text{ ms}^{-1}$       2)  $1.25 \times 10^{-3} \text{ ms}^{-1}$   
 3)  $1.25 \times 10^{-5} \text{ ms}^{-1}$       4)  $6.25 \times 10^{-3} \text{ ms}^{-1}$

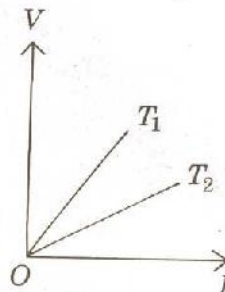
(Space for Rough Work)



36. A resistor has a colour code of green, blue, brown and silver. What is its resistance?
- 1)  $56\ \Omega \pm 5\%$
  - 2)  $560\ \Omega \pm 10\%$
  - 3)  $560\ \Omega \pm 5\%$
  - 4)  $5600\ \Omega \pm 10\%$

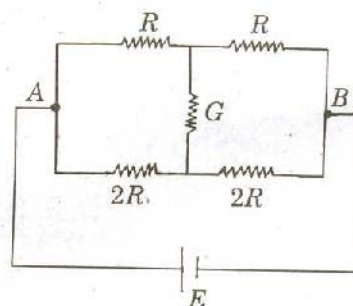
37. The voltage  $V$  and current  $I$  graphs for a conductor at two different temperatures  $T_1$  and  $T_2$  are shown in the figure. The relation between  $T_1$  and  $T_2$  is .....

- 1)  $T_1 > T_2$
- 2)  $T_1 < T_2$
- 3)  $T_1 = T_2$
- 4)  $T_1 = \frac{1}{T_2}$



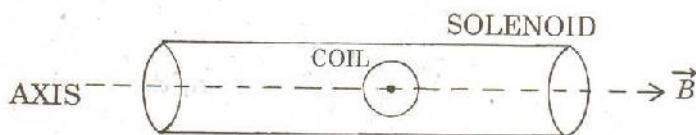
38. Consider the following statements regarding the network shown in the figure.

- a) The equivalent resistance of the network between points A and B is independent of value of  $G$ .
- b) The equivalent resistance of the network between points A and B is  $\frac{4}{3}R$ .
- c) The current through  $G$  is zero.



Which of the above statements is/are TRUE?

- 1) a) alone
  - 2) b) alone
  - 3) b) and c)
  - 4) a), b) and c)
39. The torque required to hold a small circular coil of 10 turns, area  $1\ \text{mm}^2$  and carrying a current of  $\left(\frac{21}{44}\right)\text{A}$  in the middle of a long solenoid of  $10^3$  turns/m carrying a current of 2.5A, with its axis perpendicular to the axis of the solenoid is .....
- 1)  $1.5 \times 10^{-6}\ \text{N-m}$
  - 2)  $1.5 \times 10^{-8}\ \text{N-m}$
  - 3)  $1.5 \times 10^{+6}\ \text{N-m}$
  - 4)  $1.5 \times 10^{+8}\ \text{N-m}$



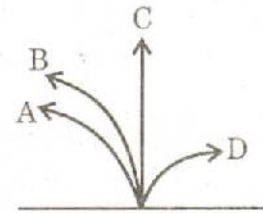
40. A particle of charge  $e$  and mass  $m$  moves with a velocity  $v$  in a magnetic field  $B$  applied perpendicular to the motion of the particle. The radius  $r$  of its path in the field is .....

- 1)  $\frac{mv}{Be}$
- 2)  $\frac{Be}{mv}$
- 3)  $\frac{ev}{Bm}$
- 4)  $\frac{Bv}{em}$

(Space for Rough Work)

41. A neutron, a proton, an electron and an  $\alpha$ -particle enter a region of uniform magnetic field with the same velocities. The magnetic field is perpendicular and directed into the plane of the paper. The tracks of the particles are labelled in the figure. The electron follows the track .....

- 1) A
- 2) B
- 3) C
- 4) D



42. The deflection in a moving coil galvanometer is reduced to half when it is shunted with a  $40\ \Omega$  coil. The resistance of the galvanometer is .....

- 1)  $80\ \Omega$
- 2)  $40\ \Omega$
- 3)  $20\ \Omega$
- 4)  $15\ \Omega$

43. A current of  $\left(\frac{2}{\sqrt{3}}\right)\text{A}$  produces a deflection of  $60^\circ$  in a tangent galvanometer. The reduction factor is .....

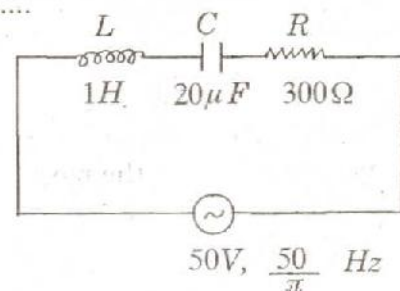
- 1)  $\left(\frac{2}{\sqrt{3}}\right)\text{A}$
- 2)  $\left(\frac{2}{3}\right)\text{A}$
- 3)  $2\text{A}$
- 4)  $\left(\frac{3}{2}\right)\text{A}$

44. In an A.C. circuit,  $V$  and  $I$  are given by  $V = 150 \sin(150t)$  volt and  $I = 150 \sin\left(150t + \frac{\pi}{3}\right)$  ampere. The power dissipated in the circuit is .....

- 1)  $106\ \text{W}$
- 2)  $150\ \text{W}$
- 3)  $5625\ \text{W}$
- 4) zero

45. In the series  $L$ - $C$ - $R$  circuit shown, the impedance is .....

- 1)  $200\ \Omega$
- 2)  $100\ \Omega$
- 3)  $300\ \Omega$
- 4)  $500\ \Omega$

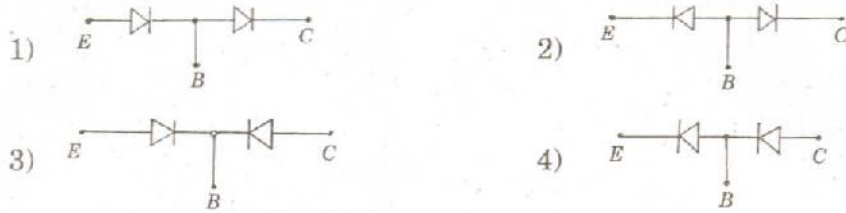


(Space for Rough Work)

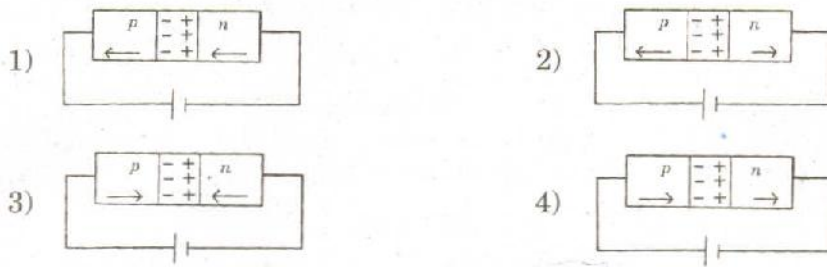




56. An  $n-p-n$  transistor can be considered to be equivalent to two diodes, connected. Which of the following figures is the CORRECT ONE?



57. In the case of forward biasing of a  $p-n$  junction diode, which one of the following figures correctly depicts the direction of conventional current (indicated by an arrow mark)?



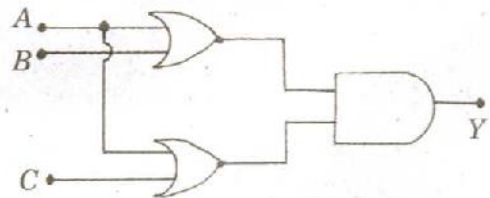
58. An electron of mass  $m_e$  and a proton of mass  $m_p$  are moving with the same speed.

The ratio of their de-Broglie's wavelengths  $\lambda_e/\lambda_p$  is .....

- 1) 1
- 2) 1836
- 3)  $\frac{1}{1836}$
- 4) 918

59. The output of given logic circuit is .....

- 1)  $A \cdot (B + C)$
- 2)  $A \cdot (B \cdot C)$
- 3)  $(A + B) \cdot (A + C)$
- 4)  $A + B + C$



60. If the scattering intensity of a liquid is 8 units at a wavelength of 500 nm, then the scattering intensity at a wavelength of 400 nm will be approximately .....

- 1) 13 units
- 2) 16 units
- 3) 20 units
- 4) 24 units

(Space for Rough Work)

**COMMON ENTRANCE TEST - 2011**

DATE	SUBJECT	TIME
28-04-2011	CHEMISTRY	02.30 PM to 03.50 PM

MAXIMUM MARKS	TOTAL DURATION	MAXIMUM TIME FOR ANSWERING
60	80 MINUTES	70 MINUTES

MENTION YOUR CET NUMBER	QUESTION BOOKLET DETAILS	
	VERSION CODE	SERIAL NUMBER
	<b>A - 1</b>	<b>727393</b>

**DOs :**

1. Check whether the CET No. has been entered and shaded in the respective circles on the OMR answer sheet.
2. This Question Booklet is issued to you by the Invigilator after the 2<sup>nd</sup> Bell, i.e., after 02.30 p.m.
3. The Serial Number of this question booklet should be entered on the OMR answer sheet.
4. The Version Code of this question booklet should be entered on the OMR answer sheet and the respective circles should be shaded completely.
5. Compulsory sign at the bottom portion of the OMR answer sheet in the space provided.

**DONTs :**

1. The timing and marks printed on the OMR answer sheet should not be damaged/mutilated/spoiled.
2. The 3<sup>rd</sup> Bell rings at 02.40 p.m. till then;
  - Do not remove the seal/staple present on the right hand side of this question booklet.
  - Do not look inside this question booklet.
  - Do not start answering on the OMR answer sheet.

**IMPORTANT INSTRUCTIONS TO CANDIDATES**

1. This question booklet contains 60 questions and each question will have one statement and four distracters (four different options / choices).
2. After the 3<sup>rd</sup> Bell is rung at 02.40 p.m., remove the seal/staple present on the right hand side of this question booklet and start answering on the OMR answer sheet.
3. During the subsequent 70 minutes :
  - Read each question carefully.
  - Choose the correct answer from out of the four available distracters (options/choices) given under each question/statement.
  - Completely **darken/shade** the relevant circle with a **BLUE OR BLACK INK BALLPOINT PEN** **against the question number on the OMR answer sheet.**

**CORRECT METHOD OF SHADING THE CIRCLE ON THE OMR SHEET IS AS SHOWN BELOW :**



4. Please note that even a minute unintended ink dot on the OMR sheet will also be recognized and recorded by the scanner. Therefore, avoid multiple markings of any kind on the OMR answer sheet.
5. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
6. After the **last bell** is rung at 03.50 p.m., stop writing on the OMR answer sheet and affix your **LEFT HAND THUMB IMPRESSION** on the OMR answer sheet as per the instructions.
7. Hand over the OMR answer sheet to the room Invigilator as it is.
8. After separating and retaining the top sheet (KEA Copy), the Invigilator will return the bottom sheet replica (Candidate's copy) to you to carry home for self-evaluation.
9. Preserve the replica of the OMR answer sheet for a minimum period of ONE year.

## CHEMISTRY

1. Which one of the following statements is FALSE?
- 1) During roasting, moisture is removed from the ore.
  - 2) The ore is freed from almost all nonmetallic impurities.
  - 3) Calcination of ore is carried out in the absence of any blast of air.
  - 4) The concentrated zinc blende is subjected to calcination during its extraction by pyrometallurgy.
2. Which one of the following sets of quantum numbers represents the highest energy level in an atom?
- 1)  $n = 4, l = 0, m = 0, s = +\frac{1}{2}$
  - 2)  $n = 3, l = 1, m = 1, s = +\frac{1}{2}$
  - 3)  $n = 3, l = 2, m = -2, s = +\frac{1}{2}$
  - 4)  $n = 3, l = 0, m = 0, s = +\frac{1}{2}$
3. When  $O_2$  is converted into  $O_2^+$ ; .....
- 1) both paramagnetic character and bond order increase
  - 2) bond order decreases
  - 3) paramagnetic character increases
  - 4) paramagnetic character decreases and the bond order increases
4. In chromite ore, the oxidation number of iron and chromium are respectively .....
- 1) +3, +2
  - 2) +3, +6
  - 3) +2, +6
  - 4) +2, +3
5. The number of naturally occurring *p*-block elements that are diamagnetic is .....
- 1) 18
  - 2) 6
  - 3) 5
  - 4) 7

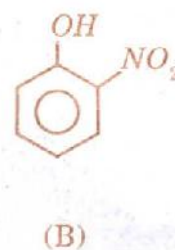
---

(Space for Rough Work)

6. If the energies of the two photons are in the ratio of 3 : 2, their wavelengths will be in the ratio of .....
- 1) 9 : 4                      2) 2 : 3  
3) 1 : 2                      4) 3 : 2
7. Which one of these is NOT TRUE for benzene?
- 1) There are three carbon-carbon single bonds and three carbon-carbon double bonds.  
2) It forms only one type of monosubstituted product.  
3) The bond angle between carbon-carbon bonds is  $120^\circ$ .  
4) Heat of hydrogenation of benzene is less than the theoretical value.
8. Generally, the first ionization energy increases along a period. But there are some exceptions. The one which is NOT an exception is .....
- 1) Na and Mg                      2) Be and B  
3) N and O                        4) Mg and Al

9. Out of the given two compounds, the vapour pressure of B at a particular temperature is .....

- 1) lower than that of A  
2) higher than that of A  
3) same as that of A  
4) higher or lower than A depending on the size of the vessel



10. Increasing order of carbon-carbon bond length for the following is .....



- 1)  $B < C < A < D$                       2)  $C < B < A < D$   
3)  $B < A < C < D$                       4)  $D < C < A < B$

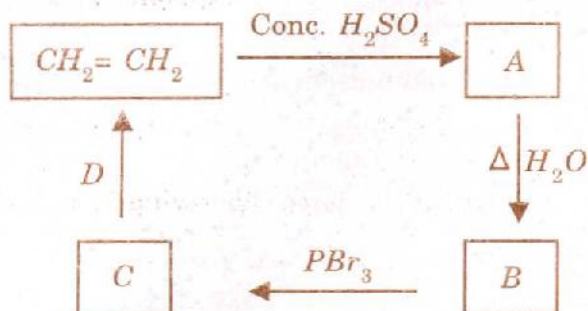
(Space for Rough Work)







21. Identify *B* and *D* in the following sequence of reactions.



- 1) Methanol and bromoethane
  - 2) Ethyl hydrogen sulphate and alcoholic *KOH*
  - 3) Ethyl hydrogen sulphate and aqueous *KOH*
  - 4) Ethanol and alcoholic *KOH*
22. The compound which gives turbidity immediately with Lucas reagent at room temperature is .....
- 1) butan-1-ol
  - 2) butan-2-ol
  - 3) 2-methyl propan-2-ol
  - 4) 2-methyl propan-1-ol
23. Ethyl benzene CANNOT be prepared by .....
- 1) Wurtz reaction
  - 2) Wurtz-Fittig reaction
  - 3) Friedel-Crafts reaction
  - 4) Clemmensen reduction
24. 1.2 g of organic compound on Kjeldahlization liberates ammonia which consumes 30 cm<sup>3</sup> of 1 N *HCl*. The percentage of nitrogen in the organic compound is .....
- 1) 30
  - 2) 35
  - 3) 46.67
  - 4) 20.8
25. Carbon cannot reduce  $\text{Fe}_2\text{O}_3$  to *Fe* at a temperature below 983 K because .....
- 1) free energy change for the formation of *CO* is more negative than that of  $\text{Fe}_2\text{O}_3$
  - 2) *CO* is thermodynamically more stable than  $\text{Fe}_2\text{O}_3$
  - 3) carbon has higher affinity towards oxygen than iron
  - 4) iron has higher affinity towards oxygen than carbon

(Space for Rough Work)

26. The yellow precipitate formed during the chromyl chloride test is chemically .....
- 1) chromic acid
  - 2) lead chromate
  - 3) lead acetate
  - 4) sodium chromate
27. One gram of silver gets distributed between 10 cm<sup>3</sup> of molten zinc and 100 cm<sup>3</sup> of molten lead at 800°C. The percentage of silver still left in the lead layer is approximately .....
- 1) 2
  - 2) 5
  - 3) 3
  - 4) 1
28. Which one of the following is true?
- 1)  $NaOH$  is used in the concentration of bauxite ore.
  - 2)  $NaOH$  is a primary standard in volumetric analysis.
  - 3) Manganous hydroxide is soluble in excess of  $NaOH$  solution.
  - 4)  $NaOH$  solution does not react with  $Cl_2$ .
29. In Ramsay and Rayleigh's isolation of noble gases from air, the nitrogen of the air is finally converted into .....
- 1)  $NaNO_2$  only
  - 2)  $NO$  and  $NO_2$
  - 3)  $NaNO_3$  only
  - 4)  $NaNO_2$  and  $NaNO_3$
30. The spin only magnetic moment of  $Fe^{2+}$  ion (in BM) is approximately .....
- 1) 4
  - 2) 7
  - 3) 5
  - 4) 6

---

(Space for Rough Work)

31. The IUPAC name of the complex  $[Co(NH_3)_4Cl_2]Cl$  is .....

- 1) dichloro tetraammine cobalt (III) chloride
- 2) tetraammine dichloro cobalt (III) chloride
- 3) tetraammine dichloro cobalt (II) chloride
- 4) tetraammine dichloro cobalt (IV) chloride

32. Excess of silver nitrate solution is added to 100 ml of 0.01 M Pentaqua chloro chromium (III) chloride solution. The mass of silver chloride obtained in grams is .....  
[Atomic mass of silver is 108].

- 1)  $287 \times 10^{-3}$
- 2)  $143.5 \times 10^{-3}$
- 3)  $143.5 \times 10^{-2}$
- 4)  $287 \times 10^{-2}$

33. The following data were obtained during the first order decomposition of  $2A_{(g)} \rightarrow B_{(g)} + C_{(s)}$  at a constant volume and at a particular temperature.

Sr. No.	Time	Total pressure in Pascal
1	At the end of 10 min	300
2	After completion	200

The rate constant in  $\text{min}^{-1}$  is .....

- 1) 0.0693
- 2) 69.3
- 3) 6.93
- 4)  $6.93 \times 10^{-4}$

34. The time required for 100% completion of a zero order reaction is .....

- 1)  $ak$
- 2)  $\frac{a}{2k}$
- 3)  $\frac{a}{k}$
- 4)  $\frac{2k}{a}$

35. The activation energy of a reaction at a given temperature is found to be  $2.303 RT \text{ J mol}^{-1}$ . The ratio of rate constant to the Arrhenius factor is .....

- 1) 0.01
- 2) 0.1
- 3) 0.02
- 4) 0.001

(Space for Rough Work)

36. pH value of which one of the following is NOT equal to one?
- 1) 0.1 M  $CH_3COOH$
  - 2) 0.1 M  $HNO_3$
  - 3) 0.05 M  $H_2SO_4$
  - 4)  $50\text{ cm}^3$  0.4 M  $HCl$  +  $50\text{ cm}^3$  0.2 M  $NaOH$
37. A buffer solution contains 0.1 mole of sodium acetate dissolved in  $1000\text{ cm}^3$  of 0.1 M acetic acid. To the above buffer solution, 0.1 mole of sodium acetate is further added and dissolved. The pH of the resulting buffer is .....
- 1)  $pK_a$
  - 2)  $pK_a + 2$
  - 3)  $pK_a - \text{Log } 2$
  - 4)  $pK_a + \text{Log } 2$
38.  $H_2S$  is passed into one  $\text{dm}^3$  of a solution containing 0.1 mole of  $Zn^{2+}$  and 0.01 mole of  $Cu^{2+}$  till the sulphide ion concentration reaches  $8.1 \times 10^{-19}$  moles. Which one of the following statements is true?  
 $[K_{sp}$  of  $ZnS$  and  $CuS$  are  $3 \times 10^{-22}$  and  $8 \times 10^{-36}$  respectively]
- 1) Only  $ZnS$  precipitates
  - 2) Both  $CuS$  and  $ZnS$  precipitate
  - 3) Only  $CuS$  precipitates
  - 4) No precipitation occurs
39.  $E_1$ ,  $E_2$  and  $E_3$  are the emfs of the following three galvanic cells respectively :
- (i)  $Zn(s) | Zn^{2+} (0.1M) || Cu^{2+} (1M) | Cu(s)$
  - (ii)  $Zn(s) | Zn^{2+} (1M) || Cu^{2+} (1M) | Cu(s)$
  - (iii)  $Zn(s) | Zn^{2+} (1M) || Cu^{2+} (0.1M) | Cu(s)$
- Which one of the following is true?
- 1)  $E_2 > E_1 > E_3$
  - 2)  $E_1 > E_2 > E_3$
  - 3)  $E_3 > E_1 > E_2$
  - 4)  $E_3 > E_2 > E_1$
40. 0.023 g of sodium metal is reacted with  $100\text{ cm}^3$  of water. The pH of the resulting solution is .....
- 1) 10
  - 2) 8
  - 3) 9
  - 4) 12

---

(Space for Rough Work)



46. A solution of two liquids boils at a temperature more than the boiling point of either of them. Hence, the binary solution shows .....

- 1) negative deviation from Raoult's law
- 2) positive deviation from Raoult's law
- 3) no deviation from Raoult's law
- 4) positive or negative deviation from Raoult's law depending upon the composition

47. Which one of the nitrogen atoms in  $H_2N - NH - \overset{\overset{O}{||}}{C} - NH_2$  is the most nucleophilic?

I      II      III

- 1) III
  - 2) I
  - 3) II
  - 4) All three nitrogen atoms are equally strong nucleophilic centers
48. The maximum number of possible optical isomers in 1-bromo-2-methyl cyclobutane is ...

- 1) 4
- 2) 2
- 3) 8
- 4) 16

49. Which one of the following is the most energetic conformation of cyclohexane?

- 1) Boat
- 2) Twisted boat
- 3) Chair
- 4) Half chair

50. Which one of the following is an intermediate in the reaction of benzene with  $CH_3Cl$  in the presence of anhydrous  $AlCl_3$ ?

- 1)  $Cl^+$
- 2)  $CH_3^-$
- 3)  $CH_3^+$
- 4) 

---

(Space for Rough Work)



51. Which one of the following is NOT TRUE for the hydrolysis of *t*-butyl bromide with aqueous  $\text{NaOH}$ ?

- 1) Reaction occurs through the  $\text{S}_{\text{N}}1$  mechanism.
- 2) The intermediate formed is a carbocation.
- 3) Rate of the reaction doubles when the concentration of alkali is doubled.
- 4) Rate of the reaction doubles when the concentration of *t*-butyl bromide is doubled.

52. Following is the substitution reaction in which  $-\text{CN}$  replaces  $-\text{Cl}$ .



To obtain propanenitrile,  $\text{R-Cl}$  should be .....

- 1) chloroethane
- 2) 1-chloropropane
- 3) chloromethane
- 4) 2-chloropropane

53. The conversion of *m*-nitrophenol to resorcinol involves respectively .....

- 1) hydrolysis, diazotization and reduction
- 2) diazotization, reduction and hydrolysis
- 3) hydrolysis, reduction and diazotization
- 4) reduction, diazotization and hydrolysis

54. Formic acid is a stronger acid than acetic acid. This can be explained using .....

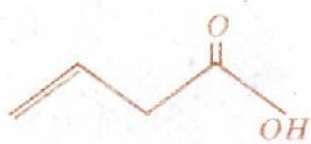
- 1) +M effect
- 2) -I effect
- 3) +I effect
- 4) -M effect

55. The reagent with which both acetaldehyde and acetone react is .....

- 1) Fehling's solution
- 2)  $\text{I}_2 / \text{NaOH}$
- 3) Tollens' reagent
- 4) Carbonic acid

---

(Space for Rough Work)

56. Which of the following gives an aldehyde on dry distillation?
- 1) Calcium formate + calcium acetate
  - 2) Calcium acetate + calcium benzoate
  - 3) Calcium acetate
  - 4) Calcium benzoate
57.  $\alpha$ -maltose consists of .....
- 1) one  $\alpha$ -D-glucopyranose unit and one  $\beta$ -D-glucopyranose unit with 1-2 glycosidic linkage
  - 2) two  $\alpha$ -D-glucopyranose units with 1-2 glycosidic linkage
  - 3) two  $\beta$ -D-glucopyranose units with 1-4 glycosidic linkage
  - 4) two  $\alpha$ -D-glucopyranose units with 1-4 glycosidic linkage
58. Which one of the following DOES NOT correctly match with each other?
- 1) Silk-polyamide
  - 2) Lipase-enzyme
  - 3) Butter-fat
  - 4) Oxytocin-enzyme
59. In an alkaline medium, glycine predominantly exists as/in a/an .....
- 1) cation
  - 2) anion
  - 3) zwitterion
  - 4) covalent form
60. The IUPAC name of  is .....
- 1) but-3-enoic acid
  - 2) but-1-enoic acid
  - 3) pent-4-enoic acid
  - 4) prop-2-enoic acid

---

(Space for Rough Work)

**COMMON ENTRANCE TEST - 2011**

<b>DATE</b>	<b>SUBJECT</b>	<b>TIME</b>
<b>27-04-2011</b>	<b>BIOLOGY</b>	<b>10.30 AM to 11.50 AM</b>
<b>MAXIMUM MARKS</b>	<b>TOTAL DURATION</b>	<b>MAXIMUM TIME FOR ANSWERING</b>
<b>60</b>	<b>80 MINUTES</b>	<b>70 MINUTES</b>

<b>MENTION YOUR CET NUMBER</b>	<b>QUESTION BOOKLET DETAILS</b>	
	<b>VERSION CODE</b>	<b>SERIAL NUMBER</b>
	<b>A - 1</b>	<b>222833</b>

**DOs :**

1. Check whether the CET No. has been entered and shaded in the respective circles on the OMR answer sheet.
2. This Question Booklet is issued to you by the Invigilator after the 2<sup>nd</sup> Bell, i.e., after 10.30 a.m.
3. The Serial Number of this question booklet should be entered on the OMR answer sheet.
4. The Version Code of this question booklet should be entered on the OMR answer sheet and the respective circles should be shaded completely.
5. Compulsory sign at the bottom portion of the OMR answer sheet in the space provided.

**DON'Ts :**

1. The timing and marks printed on the OMR answer sheet should not be damaged/mutilated/spoiled.
2. The 3<sup>rd</sup> Bell rings at 10.40 a.m. till then;
  - Do not remove the seal/staple present on the right hand side of this question booklet.
  - Do not look inside this question booklet.
  - Do not start answering on the OMR answer sheet.

**IMPORTANT INSTRUCTIONS TO CANDIDATES**

1. This question booklet contains 60 questions and each question will have one statement and four distracters (four different options / choices).
2. After the 3<sup>rd</sup> Bell is rung at 10.40 a.m., remove the seal/staple present on the right hand side of this question booklet and start answering on the OMR answer sheet.
3. During the subsequent 70 minutes :
  - Read each question carefully.
  - Choose the correct answer from out of the four available distracters (options/choices) given under each question/statement.
  - Completely **darken/shade** the relevant circle with a **BLUE OR BLACK INK BALLPOINT PEN** against the question number on the OMR answer sheet.

**CORRECT METHOD OF SHADING THE CIRCLE ON THE OMR SHEET IS AS SHOWN BELOW :**

4. Please note that even a minute unintended ink dot on the OMR sheet will also be recognized and recorded by the scanner. Therefore, avoid multiple markings of any kind on the OMR answer sheet.
5. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
6. After the last bell is rung at 11.50 a.m., stop writing on the OMR answer sheet and affix your LEFT HAND THUMB IMPRESSION on the OMR answer sheet as per the instructions.
7. Hand over the OMR answer sheet to the room Invigilator as it is.
8. After separating and retaining the top sheet (KEA Copy), the Invigilator will return the bottom sheet replica (Candidate's copy) to you to carry home for self-evaluation.
9. Preserve the replica of the OMR answer sheet for a minimum period of ONE year.

**BIOLOGY**

1. Four children belonging to the same parents have the following blood groups A, B, AB and O. Hence, the genotypes of the two parents are .....
  - 1) Both parents are homozygous for 'A' group
  - 2) One parent is homozygous for 'A' and another parent is homozygous for 'B'
  - 3) One parent is heterozygous for 'A' and another parent is heterozygous for 'B'
  - 4) Both parents are homozygous for 'B' group
  
2. Mitotic stages are not observed in .....
  - 1) *Cosmarium*
  - 2) *E.coli*
  - 3) *Saccharomyces*
  - 4) *Chlorella*
  
3. The types of ribosomes found in prokaryotic cell are .....
  - 1) 100 S
  - 2) 80 S
  - 3) 60 S
  - 4) 70 S
  
4. The name of Smt. Thimmakka is associated with the .....
  - 1) planting and conservation of avenue trees
  - 2) agitations against hydroelectric project
  - 3) 'Appiko' movement
  - 4) conservation of fauna and flora of the western ghats
  
5. Dog distemper is a disease carried by a .....
  - 1) bacterium
  - 2) viroid
  - 3) prion
  - 4) virus

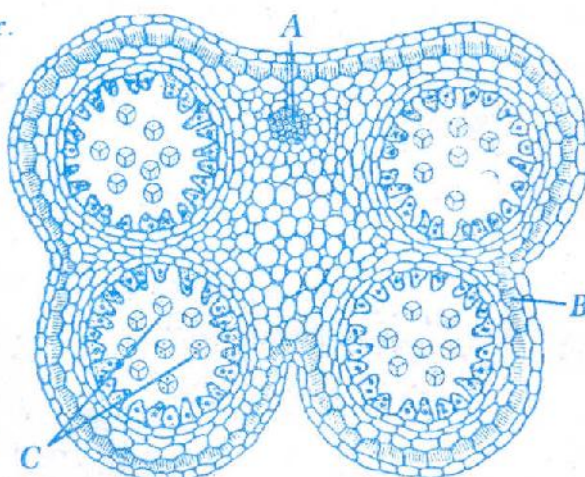
---

(Space for Rough Work)

6. When a fresh water protozoan is placed in marine water, .....
- 1) the contractile vacuole disappears
  - 2) the contractile vacuole increases in size
  - 3) a number of contractile vacuoles appear
  - 4) the contractile vacuole remains unchanged
7. The 2005 Nobel Prize for Physiology/Medicine was awarded to Barry Marshall and Robin Warren of Australia for their discovery of .....
- 1) human papilloma virus causing cervical cancer
  - 2) bacterium helicobacter pylori causing peptic ulcer
  - 3) prions, a new biological principle of infection
  - 4) Human Immunodeficiency Virus

8. The following is the diagram of T.S. of Anther. Identify the parts labelled A, B, C.

- 1) A = Connective, B = Endothecium, C = Pollen grain
- 2) A = Endothecium, B = Connective, C = Pollen grain
- 3) A = Pollen grain, B = Connective, C = Endothecium
- 4) A = Endothecium, B = Pollen grain, C = Connective



9. Pick the mammal with true placenta :

- |             |             |
|-------------|-------------|
| 1) Kangaroo | 2) Echidna  |
| 3) Platypus | 4) Mongoose |

10. Which one of the following is correct?

- 1) Introns are present in m-RNA and exons are present in t-RNA.
- 2) Codons are present in m-RNA and anticodons in t-RNA.
- 3) Every intron is a set of three terminator codons.
- 4) Exons are present in eukaryotes while introns are present in prokaryotes.

---

(Space for Rough Work)

11. Casparian strips are present in the ..... of the root.

- 1) epiblema
- 2) cortex
- 3) pericycle
- 4) endodermis

12. How do you differentiate a frog from a toad?

- 1) Frog has no exoskeleton but toad has scales.
- 2) Frog respire through lungs but toad respire through skin.
- 3) Frog has a tail but toad has no tail.
- 4) Frog has no parotid glands but toad has a pair of parotid glands.

13. Column I contains larval stages and column II contains the group to which it belongs. Match them correctly and choose the right answer.

	Column I		Column II
A	Planula	p	Annelida
B	Tornaria	q	Mollusca
C	Trochophore	r	Arthropoda
D	Bipinnaria	s	Chordata
E	Glochidium	t	Echinodermata
		u	Coelenterata

- 1) A = u, B = s, C = p, D = t, E = q
- 2) A = q, B = t, C = p, D = s, E = u
- 3) A = t, B = s, C = r, D = q, E = p
- 4) A = s, B = r, C = q, D = p, E = t

14. Read the following statements A and B.

A : Many organs of aquatic plants float in water.

B : Large air gaps are present in the collenchyma tissues of lotus leaf.

Select the correct answer.

- 1) Statement A is correct and B is wrong.
- 2) Statement B is correct and A is wrong.
- 3) Statements A and B both are correct.
- 4) Statements A and B both are wrong.

15. Arrange the following in the ascending order of Linnaean hierarchy.

- 1) Kingdom – order – species – genus – class – family – phylum.
- 2) Kingdom – family – genus – species – class – phylum – order.
- 3) Kingdom – phylum – class – order – family – genus – species.
- 4) Species – genus – family – order – class – phylum – kingdom.

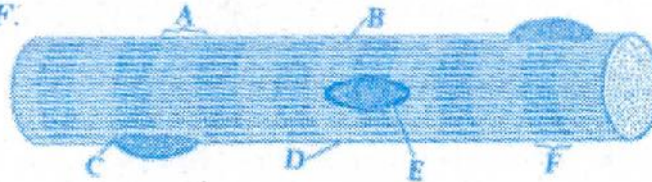
---

(Space for Rough Work)

16. Animals which possess cleidoic eggs exhibit.

- 1) External fertilization and internal development
- 2) Internal fertilization and internal development
- 3) Internal fertilization and external development
- 4) External fertilization and external development

17. The diagram given below represents the histology of a striped muscle. Label the parts A, B, C, D, E and F.



- 1) A - Sarcoplasm, B - Nucleus, C - Sarcolemma, D - Myofibril, E - Dark band, F - Light band.
- 2) A - Sarcoplasm, B - Light band, C - Myofibril, D - Sarcolemma, E - Nucleus, F - Dark band.
- 3) A - Light band, B - Sarcoplasm, C - Myofibril, D - Sarcolemma, E - Nucleus, F - Dark band.
- 4) A - Sarcolemma, B - Nucleus, C - Dark band, D - Light band, E - Sarcoplasm, F - Myofibril.

18. Populations are said to be allopatric when .....

- 1) they are physically isolated by natural barriers
- 2) they are sharing the same area but cannot interbreed
- 3) they live together and breed freely to produce viable offspring
- 4) they are isolated but often come together for breeding

19. The World Intellectual Property Day is observed on .....

- |                               |                               |
|-------------------------------|-------------------------------|
| 1) February, 29 <sup>th</sup> | 2) June, 30 <sup>th</sup>     |
| 3) April, 26 <sup>th</sup>    | 4) September, 5 <sup>th</sup> |

20. Which one of the following is an example of chlorophyllous thallophyte?

- |                |              |
|----------------|--------------|
| 1) Volvariella | 2) Spirogyra |
| 3) Nephrolepis | 4) Gnetum    |

---

(Space for Rough Work)

21. Pinus belongs to the class .....
- |                  |                |
|------------------|----------------|
| 1) Gnetopsida    | 2) Cycadopsida |
| 3) Coniferopsida | 4) Sphenopsida |
22. With reference to enzymes, which one of the following statements is true?
- |                                      |
|--------------------------------------|
| 1) Apoenzyme = Holoenzyme + Coenzyme |
| 2) Holoenzyme = Apoenzyme + Coenzyme |
| 3) Coenzyme = Apoenzyme + Holoenzyme |
| 4) Holoenzyme = Coenzyme - Apoenzyme |
23. Gametophyte is the dominant phase in the lifecycle of .....
- |             |                |
|-------------|----------------|
| 1) Hibiscus | 2) Nephrolepis |
| 3) Cycas    | 4) Riccia      |
24. In a typical Mendelian cross which is a dihybrid cross, one parent is homozygous for both dominant traits and another parent is homozygous for both recessive traits. In the  $f_2$  generation, both parental combinations and recombinations appear. The phenotypic ratio of parental combinations to recombinations is .....
- |           |           |
|-----------|-----------|
| 1) 10 : 6 | 2) 12 : 4 |
| 3) 9 : 7  | 4) 15 : 1 |
25. A balanced diet does NOT include .....
- |                           |                              |
|---------------------------|------------------------------|
| 1) Carbohydrates and fats | 2) Nucleic acids and enzymes |
| 3) Proteins and vitamins  | 4) Minerals and salts        |

---

(Space for Rough Work)



26. Match the types of the fruits listed in column I, with the examples listed in column II. Choose the answer which gives the correct combination of alphabets of the two columns.

	Column I		Column II
A	Capsule	p	Paddy
B	Berry	q	Mango
C	Drupe	r	Sunflower
D	Cypsela	s	Tomato
		t	Ladies finger

- 1) A = t, B = s, C = q, D = r                      2) A = t, B = r, C = p, D = q  
 3) A = s, B = t, C = q, D = r                      4) A = p, B = q, C = r, D = t
27. In genetic code, 61 codons code for 20 different types of amino acids. This is called
- 1) Colinearity    2) Commaless  
 3) Degeneracy    4) Nonambiguity
28. By the statement 'survival of the fittest', Darwin meant that .....
- 1) The strongest of all species survives  
 2) The most intelligent of the species survives  
 3) The cleverest of the species survives  
 4) The most adaptable of the species to changes survives
29. Which one of the following plants is considered as lesser known species of food crops?
- 1) Psophocarpus tetragonolobus                      2) Sorghum Vulgare  
 3) Eleusine Coracana                                      4) Pennisetum typhoides
30. When 2 to 3 drops of Benedicts reagent are added to a urine sample and heated gently, it turns yellow. This colour change indicates that .....
- 1) Urine contains 2% glucose                      2) Urine contains 0.5% glucose  
 3) Urine contains 1.5% glucose                      4) Urine contains 1% glucose

---

(Space for Rough Work)

31. BT brinjal is an example of transgenic crops. In this, BT refers to .....
- 1) Bacillus tuberculosis
  - 2) Biotechnology
  - 3) Betacarotene
  - 4) Bacillus thuringiensis
32. Which one of the following is NOT an antitranspirant?
- 1) PMA
  - 2) BAP
  - 3) Silicon oil
  - 4) Low viscosity
33. The brainstem is made up of .....
- 1) Midbrain, pons, cerebellum
  - 2) Midbrain, pons, medulla oblongata
  - 3) Diencephalon, medulla oblongata, cerebellum
  - 4) Cerebellum, cerebrum, medulla oblongata
34. The loosely arranged nonchlorophyllous parenchyma cells present in lenticels are called
- 1) Complementary cells
  - 2) Passage cells
  - 3) Water stomata
  - 4) Albuminous cells
35. Column I contains terms and column II contains definitions. Match them correctly and choose the right answer.

	Column I		Column II
A	Parturition	p	Attachment of zygote to endometrium
B	Gestation	q	Release of egg from Graafian follicle
C	Ovulation	r	Delivery of baby from uterus
D	Implantation	s	Duration between pregnancy and birth
E	Conception	t	Formation of zygote by fusion of the egg and sperm
		u	Stoppage of ovulation and menstruation

- 1) A = q, B = s, C = p, D = t, E = r
- 2) A = s, B = r, C = p, D = t, E = q
- 3) A = t, B = p, C = q, D = r, E = s
- 4) A = r, B = s, C = q, D = p, E = t

(Space for Rough Work)

36. CAM pathway is observed in .....
- |              |              |
|--------------|--------------|
| 1) Pineapple | 2) Maize     |
| 3) Sunflower | 4) Sugarcane |
37. The number of ATP produced when a molecule of glucose undergoes fermentation is
- |      |       |
|------|-------|
| 1) 4 | 2) 36 |
| 3) 2 | 4) 38 |
38. Silk produced by Antheraea mylitta is also called .....
- |              |                |
|--------------|----------------|
| 1) Muga silk | 2) Tassar silk |
| 3) Eri silk  | 4) Mysore silk |
39. Which of the following hormones is a steroid?
- |             |              |
|-------------|--------------|
| 1) Estrogen | 2) Insulin   |
| 3) Glucagon | 4) Thyroxine |
40. More men suffer from colour blindness than women because .....
- 1) women are more resistant to disease than men
  - 2) the male sex hormone testosterone causes the disease
  - 3) the colour blind gene is carried on the 'Y' chromosome
  - 4) men are hemizygous and one defective gene is enough to make them colour blind

---

(Space for Rough Work)

41. Which one of the following theories on the origin of life is mostly accepted?
- 1) Special creation
  - 2) Steady state
  - 3) Panspermia
  - 4) Chemical origin
42. The rosette habit of cabbage can be changed by application of .....
- 1) IAA
  - 2) GA
  - 3) ABA
  - 4) Ethaphon
43. Effective filtration pressure in glomerulus is caused due to .....
- 1) powerful pumping action of the heart
  - 2) secretion of adrenalin
  - 3) Afferent arteriole is slightly larger than efferent arteriole
  - 4) Vacuum develops in proximal convoluted tubule and sucks the blood
44. Banana bunchytop virus is transmitted through .....
- 1) Pentalonia nigronervosa
  - 2) Aedes aegypti
  - 3) Culex sp
  - 4) Agribacterium sp
45. In a tissue culture media, the resource of the phytohormone is .....
- 1) Agar agar
  - 2) Glucose
  - 3) Micronutrients
  - 4) Coconut milk

---

(Space for Rough Work)

46. With reference to the pituitary, which of the following statements is true?

- 1) Neurohypophysis secretes vasopressin and oxytocin.
- 2) Neurohypophysis secretes TSH and STH.
- 3) Neurohypophysis collects and stores vasopressin and oxytocin.
- 4) Adenohypophysis secretes vasopressin and oxytocin.

47. Column I contains some terms and column II contains their meanings. Match them properly and choose the right answer.

	Column I		Column II
A	Glycogenesis	p	Conversion of glycogen to glucose
B	Glycosuria	q	Conversion of glucose to glycogen
C	Glyconeogenesis	r	Excretion of glucose in urine
D	Glycogenolysis	s	Conversion of noncarbohydrate sources to glucose
		t	Conversion of glucose to starch

- 1) A = p, B = q, C = r, D = s
- 2) A = q, B = r, C = s, D = p
- 3) A = q, B = p, C = r, D = s
- 4) A = p, B = t, C = q, D = s

48. The term, genetic RNA refers to .....

- 1) genetic material of RNA viruses
- 2) the RNA that carries genetic message
- 3) the RNA that helps gene regulation in lac-operon
- 4) the RNA present in mitochondria

49. As per the guidelines of the Indian Red Cross society, which of the following persons is recommended for blood donation?

- 1) People not in good health, under the influence of alcohol or drugs.
- 2) Ladies during menstruation, pregnancy and breast feeding.
- 3) Healthy women but unwed and below the age of 35.
- 4) Persons who are immunized with live vaccines.

50. In a typical heart, if EDV is 120 ml of blood and ESV is 50 ml of blood, the stroke volume (SV) is .....

- 1)  $120 - 50 = 70$  ml
- 2)  $120 + 50 = 170$  ml
- 3)  $120 \times 50 = 6000$  ml
- 4)  $120 \div 50 = 2.4$  ml

---

(Space for Rough Work)

51. The term, 'southern blotting' refers to .....
- 1) transfer of DNA fragments from invitro cellulose membrane to electrophoresis gel
  - 2) attachment of probes to DNA fragments
  - 3) transfer of DNA fragments from electrophoresis gel to nitrocellulose sheet
  - 4) comparison of DNA fragments from two sources
52. In some chordates, the notochord is modified as the vertebral column. Such animals are called vertebrates. Which of the following statements make sense?
- 1) All chordates are vertebrates but all vertebrates are not chordates.
  - 2) All vertebrates are chordates and all chordates are vertebrates.
  - 3) All vertebrates are chordates but all chordates are not vertebrates.
  - 4) Chordates are not vertebrates and vertebrates are not chordates.
53. A clone is .....
- 1) a group of genetically similar organisms produced through asexual reproduction
  - 2) a group of genetically similar organisms produced through sexual reproduction
  - 3) a group of dissimilar organisms produced as a result of asexual reproduction
  - 4) a group of genetically dissimilar organisms produced as a result of sexual reproduction
54. The space between the plasma membrane and the cell wall of a plasmolyzed cell surrounded by a hypertonic solution is occupied by the .....
- |                        |                      |
|------------------------|----------------------|
| 1) hypotonic solution  | 2) isotonic solution |
| 3) hypertonic solution | 4) water             |
55. When the blood contains a high percentage of  $CO_2$  and a very low percentage of  $O_2$ , the breathing stops and the person becomes unconscious. This condition is known as .....
- |                |             |
|----------------|-------------|
| 1) suffocation | 2) asphyxia |
| 3) emphysema   | 4) eupnoea  |

---

(Space for Rough Work)

56. Which one of the following is not related to guttation?
- 1) Water is given out in the form of droplets.
  - 2) Water given out is impure.
  - 3) Water is given out during daytime.
  - 4) Guttation is of universal occurrence.
57. The force responsible for upward conduction of water against gravity comes from .....
- 1) transpiration
  - 2) photosynthesis
  - 3) translocation
  - 4) respiration
58. Column I contains names of the sphincter muscles of the alimentary canal and column II contains their locations. Match them properly and choose the correct answer.

	Column I		Column II
A	Sphincter of ani internus	p	opening of hepatopancreatic duct into duodenum
B	Cardiac sphincter	q	between duodenum and posterior stomach
C	Sphincter of oddi	r	guarding the terminal part of alimentary canal
D	Ileocaecal sphincter	s	between oesophagus and anterior stomach
E	Pyloric sphincter	t	between small intestine and bowel

- 1) A = r, B = q, C = s, D = p, E = t
  - 2) A = q, B = t, C = p, D = s, E = r
  - 3) A = r, B = s, C = p, D = t, E = q
  - 4) A = s, B = r, C = p, D = q, E = t
59. Which one of the following reactions is an example of oxidative decarboxylation?
- 1) Conversion of succinate to fumerate.
  - 2) Conversion of fumerate to malate.
  - 3) Conversion of pyruvate to acetyl CoA.
  - 4) Conversion of citrate to isocitrate.
60. Chemiosmosis hypothesis given by Peter Mitchel proposes the mechanism of .....
- 1) synthesis of NADH
  - 2) synthesis of ATP
  - 3) synthesis of  $FADH_2$
  - 4) synthesis of NADPH

---

(Space for Rough Work)