

**NEET
(UG)**



the STOP to train minds

**2020
MT-05**

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MOCK TEST

Duration : 3 Hours

Max. Marks : 720

IMPORTANT INSTRUCTIONS

1. The test is of **3 hours** duration and Test Booklet contains **180** questions. Each question carries **4** marks. For each correct response, the candidate will get **4** marks. For each incorrect response, **one mark** will be deducted from the total scores. The maximum marks are **720**.
2. Use **Blue/Black Ball Point Pen only** for writing particulars on this page/markings responses.
3. Rough work is to be done on the space provided for this purpose in the Test Booklet only.
4. **On completion of the test, the candidate must handover the Answer Sheet to the invigilator in the Room/Hall. The candidates are allowed to take away this Test Booklet with them.**
5. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your roll no. anywhere else except in the specified space in the Test Booklet/Answer Sheet.
6. Use of white fluid for correction is **NOT** permissible on the Answer Sheet.
7. Each candidate must show on demand his/her Admission Card to the Invigilator.
8. No candidate, without special permission of the Superintendent or Invigilator, would leave his/her seat.
9. The candidates should not leave the Examination Hall without handing over their Answer Sheet to the Invigilator on duty and sign the Attendance Sheet twice. Cases where a candidate has not signed the Attendance Sheet the second time will be deemed not to have handed over Answer Sheet and dealt with as an unfair means case.
10. Use of Electronic/Manual Calculator is prohibited.
11. No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.
12. The candidates will write the Correct Test Booklet Code as given in the Test Booklet/Answer Sheet in the Attendance Sheet.

Name of the Candidate (in Capital letters) : _____

Roll Number :

Batch No. :

Name of Examination Centre (in Capital letters) : _____

Candidate's Signature : _____ Invigilator's Signature : _____

PHYSICS

1. The relation $p = \frac{\alpha}{\beta} e^{\frac{-\alpha Z}{k\theta}}$, where p is pressure, Z is distance, k is Boltzmann constant and θ is temperature. The dimensional formula of β will be

(1) $[M^0L^2T^0]$ (2) $[ML^2T]$
 (3) $[ML^0T^{-1}]$ (4) $[M^0L^2T^{-1}]$

2. A police jeep is chasing with velocity of 45 km/h, a thief in another jeep moving with velocity 153 kmh^{-1} . Police fires a bullet with muzzle velocity of 180 ms^{-1} . The velocity with which it will strike the car of the thief is

(1) 150 ms^{-1} (2) 27 ms^{-1}
 (3) 450 ms^{-1} (4) 250 ms^{-1}

3. Two particles are simultaneously projected in opposite directions horizontally from a given point in space where gravity g is uniform. If u_1 and u_2 be their initial speeds, then the time t after which their velocities are mutually perpendicular is given by

(1) $\frac{\sqrt{u_1 u_2}}{g}$ (2) $\frac{\sqrt{u_1^2 + u_2^2}}{g}$
 (3) $\frac{\sqrt{u_1(u_1 + u_2)}}{g}$ (4) $\frac{\sqrt{u_2(u_1 + u_2)}}{g}$

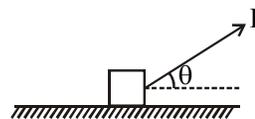
4. By keeping moment of inertia of a body constant, if we double the time period, then angular momentum of the body

(1) remain constant (2) becomes half
 (3) doubles (4) quadruples

5. A body of mass 0.25 kg is projected with muzzle velocity 100 ms^{-1} from a tank of mass 100 kg. What is the recoil velocity of the tank?

(1) 5 ms^{-1} (2) 25 ms^{-1}
 (3) 0.5 ms^{-1} (4) 0.25 ms^{-1}

6. A block of mass m is pulled along a horizontal surface by applying a force at an angle θ with the horizontal. If the block travels with a uniform velocity and has a displacement d and the coefficient of friction is μ , then the work done by the applied force is



(1) $\frac{\mu mgd}{\cos \theta + \mu \sin \theta}$ (2) $\frac{\mu mgd \cos \theta}{\cos \theta + \mu \sin \theta}$
 (3) $\frac{\mu mgd \sin \theta}{\cos \theta + \mu \sin \theta}$ (4) $\frac{\mu mgd \cos \theta}{\cos \theta - \mu \sin \theta}$

7. The potential energy of a particle of mass 1 kg is, $U = 10 + (x - 2)^2$. Here U is in joule and x in metre on the positive X -axis. Particle travels upto $x = +6$ m. Choose the correct statement.

(1) On negative X -axis particle travels upto $x = -2$ m
 (2) The maximum kinetic energy of the particle is 16 J
 (3) Both (1) and (2) are correct
 (4) Both (1) and (2) are incorrect

8. When a disc rotates with uniform angular velocity which of the following is not true?

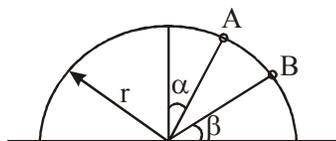
(1) The sense of rotation remains same
 (2) The orientation of the axis of rotation remains same
 (3) The speed of rotation is non-zero and remains same
 (4) The angular acceleration is non-zero and remains same

9. A body is projected from earth's surface to become its satellite, its time period of revolution will not depend upon

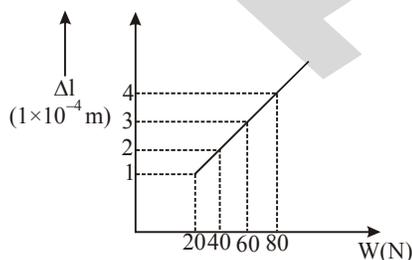
(1) mass of earth
 (2) its own mass
 (3) gravitational constant
 (4) radius of orbit

SPACE FOR ROUGH WORK

10. A particle moves from rest at A on the surface of a smooth circular cylinder of radius r as shown. At B it leaves the cylinder. The equation relating α and β is



- (1) $3 \sin \alpha = 2 \cos \beta$ (2) $2 \sin \alpha = 3 \cos \beta$
 (3) $3 \sin \beta = 2 \cos \alpha$ (4) $2 \sin \beta = 3 \cos \alpha$
11. Which of the following quantities is always negative in SHM
- (1) $\vec{F} \cdot \vec{a}$ (2) $\vec{v} \cdot \vec{s}$
 (3) $\vec{a} \cdot \vec{s}$ (4) $\vec{F} \cdot \vec{v}$
12. Doppler shift in frequency does not depend upon
- (1) the frequency of the wave produced
 (2) the velocity of source
 (3) the velocity of observer
 (4) distance from the source to the listener
13. The graph shown below gives the extension (Δl) of a wire of length 1 m suspended from the top of a roof at one end with a load W connected to the other end. If the cross-sectional area of the wire is 10^{-6} m^2 , calculate the Young's modulus of the material of the wire.



- (1) $2 \times 10^{11} \text{ N/m}^2$ (2) $2 \times 10^{-11} \text{ N/m}^2$
 (3) $3 \times 10^{-12} \text{ N/m}^2$ (4) $2 \times 10^{-13} \text{ N/m}^2$

14. Under isothermal condition two soap bubbles of radii r_1 and r_2 coalesce to form a single bubble of radius r . The external pressure is p_0 . The surface tension of the soap is in terms of the given parameters is

(1) $\frac{2p_0(r^3 - r_1^3 - r_2^3)}{4(r_1^2 + r_2^2 - r^2)}$ (2) $\frac{p_0(r^3 - r_1^3 - r_2^3)}{4(r_1^2 + r_2^2 - r^2)}$
 (3) $\frac{p_0(r^3 + r_1^2 + r_2^3)}{4(r_1^2 + r_2^2 + r^2)}$ (4) $\frac{p_0(r^3 - r_1^3 - r_2^3)}{2(r_1^2 + r_2^2 - r)}$

15. A piece of metal weighs 46 g in air. When it is immersed in a liquid of specific gravity 1.24 at 27°C , it weighs 30 g. When the temperature is raised to 42°C , the metal piece weighs 30.5 g. If the specific gravity of the liquid at 42°C is 1.20, the coefficient of linear expansion of the metal is

(1) $1.4 \times 10^{-5} \text{ }^\circ\text{C}^{-1}$ (2) $2.3 \times 10^{-5} \text{ }^\circ\text{C}^{-1}$
 (3) $4.3 \times 10^{-5} \text{ }^\circ\text{C}^{-1}$ (4) $3.4 \times 10^{-5} \text{ }^\circ\text{C}^{-1}$

16. The average kinetic energy per mole of hydrogen at given temperature is

(1) equal of that of oxygen
 (2) 16 times that of oxygen
 (3) $\frac{1}{16}$ times that of oxygen
 (4) $\frac{1}{8}$ times that of oxygen

17. A bimetallic strip is made of aluminium and steel ($\alpha_{\text{Al}} > \alpha_{\text{Steel}}$) on heating, the strip will

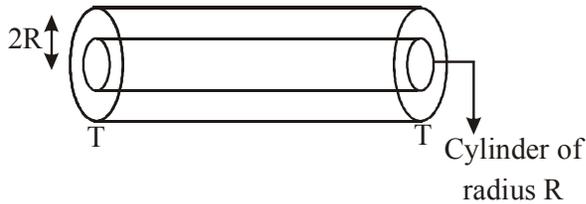
- (1) remains straight
 (2) get twisted
 (3) will bend with aluminium on concave side
 (4) will bend with steel on concave side

18. In adiabatic process, the work done by system is 50 J, then

- (1) the temperature of the system will be increased by 50°C
 (2) the temperature of the system will be constant
 (3) the internal energy of the system will be increased by 50J
 (4) the internal energy of the system will be decreased by 30J

SPACE FOR ROUGH WORK

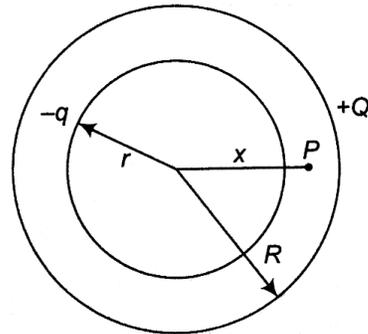
19. A cylinder of radius R of thermal conductivity K_1 is surrounded by a cylindrical shell of inner radius R and outer radius $2R$ made of thermal conductivity K_2 . The two ends of the whole system are maintained at two different temperatures T_1 and T_2 ($T_1 < T_2$). The system is in steady state and there is no loss of heat across cylindrical surface. The electrical thermal conductivity of the system is



- (1) $K = K_1 + K_2$ (2) $K = \frac{K_1 K_2}{K_1 + K_2}$
 (3) $K = \frac{K_1 + 3K_2}{4}$ (4) $K = \frac{3K_1 + K_2}{4}$

20. A tube of length 1.05 m is closed at one end. If the velocity of sound in air be 336 ms^{-1} , then the fundamental and the next higher overtone in Hz are
 (1) 80, 160 (2) 80, 240
 (3) 160, 320 (4) 160, 480
21. In electromagnetic induction, the induced charge in a coil is independent of
 (1) Change in flux
 (2) time taken to charge the flux
 (3) resistance in the circuit
 (4) can not be predicted
22. A pipe of 30 cm long open at both the ends produces harmonics. Which harmonic mode of pipe resonates at 1.1 kHz source? Given, speed of sound in air = 330 ms^{-1}
 (1) Fifth harmonic (2) Fourth harmonic
 (3) Third harmonic (4) Second harmonic

23. A hollow sphere of radius r is put inside another hollow sphere of radius R . The charges on the two are $+Q$ and $-q$ as shown in the figure. A point P is located at a distance x from the common centre such that $r < x < R$. The potential at the point P is

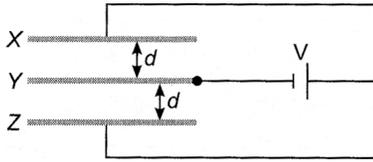


- (1) $\frac{1}{4\pi\epsilon_0} \left(\frac{Q-q}{x} \right)$ (2) $\frac{1}{4\pi\epsilon_0} \left(\frac{Q}{R} - \frac{q}{r} \right)$
 (3) $\frac{1}{4\pi\epsilon_0} \left(\frac{Q}{R} - \frac{q}{x} \right)$ (4) $\frac{1}{4\pi\epsilon_0} \left(\frac{q}{r} - \frac{Q}{x} \right)$

24. If the rms current in a 50 Hz Ac circuit is 5A, the value of the current $\frac{1}{300}$ sec after its value becomes zero is
 (1) $5\sqrt{4}$ A (2) $5\sqrt{\frac{3}{2}}$ A
 (3) $\frac{5}{6}$ A (4) $\frac{5}{\sqrt{2}}$ A
25. A small element l is cut from a circular ring of radius a and λ charge per unit length. The net electric field at the centre of ring is
 (1) zero (2) $\frac{\lambda l}{4\pi\epsilon_0 a^2}$
 (3) infinity (4) $\frac{\lambda}{4\pi\epsilon_0 l}$

SPACE FOR ROUGH WORK

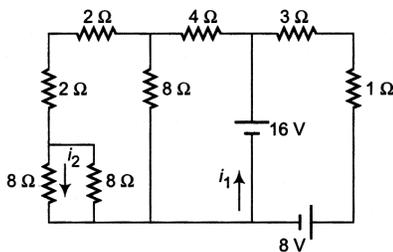
26. Consider the arrangement of three plates X, Y and Z each of area A and separation d. The energy stored when the plates are fully charged is



- (1) $\frac{\epsilon_0 AV^2}{2d}$ (2) $\frac{\epsilon_0 AV^2}{d}$
 (3) $\frac{2\epsilon_0 AV^2}{d}$ (4) $\frac{3\epsilon_0 AV^2}{2d}$
27. A cell supplies a current i_1 through a resistance R_1 and a current i_2 through a resistance R_2 . The internal resistance of this cell is

- (1) $R_2 - R_1$ (2) $\frac{i_1 R_2 - i_2 R_1}{i_1 - i_2}$
 (3) $\frac{i_2 R_2 - i_1 R_1}{i_1 - i_2}$ (4) $\left(\frac{i_1 + i_2}{i_1 - i_2}\right) \sqrt{R_1 R_2}$

28. In the circuit shown in figure, the ratio of currents i_1/i_2 is.



- (1) 2 (2) 8
 (3) 0.5 (4) 4
29. Which of the following is used to produce radio wave of constant amplitude?
- (1) Oscillator (2) FET
 (3) rectifier (4) amplifier

30. The magnetic field due to short bar magnet of magnetic dipole moment M and length 2l, on the axis at a distance z (where $z \gg l$) from the centre of the magnet is given by formula

- (1) $\frac{\mu_0 M}{4\pi z^3} \hat{M}$ (2) $\frac{2\mu_0 M}{4\pi z^3} \hat{M}$
 (3) $\frac{4\mu_0 M}{\mu_0 z^3} \hat{M}$ (4) $\frac{\mu_0 M}{2\pi z^3} \hat{M}$

31. The focal length of a converging lens is measured for violet, green and red colours. It is respectively f_v, f_g, f_r . We will find that

- (1) $f_v = f_r$ (2) $f_v < f_r$
 (3) $f_v > f_r$ (4) $f_g > f_r$

32. A coil of inductance $L = 50\mu\text{H}$ and resistance $= 0.5\Omega$ is connected to a battery of emf $= 5\text{V}$. A resistance of 10Ω is connected parallel to the coil. Now at some instant the connection of the battery is switched off. Then, the amount of heat generated in the coil after switching off the battery is

- (1) 1.25 mJ (2) 2.5 mJ
 (3) 0.65 mJ (4) 0.12 mJ

33. The magnification produced by an astronomical telescope for normal adjustment is 10 and the length of telescope is 1.1 m. The magnification, where the image is formed at least distance of distinct vision is

- (1) 6 (2) 14
 (3) 8 (4) 5

34. If ϵ_0 and μ_0 are respectively, the electric permittivity and the magnetic permeability of free space, ϵ and μ the corresponding quantities in a medium, the refractive index of the medium is

- (1) $\sqrt{\frac{\mu\epsilon}{\mu_0\epsilon_0}}$ (2) $\frac{\mu\epsilon}{\mu_0\epsilon_0}$
 (3) $\sqrt{\frac{\mu_0\epsilon_0}{\mu\epsilon}}$ (4) $\sqrt{\frac{\mu\mu_0}{\epsilon\epsilon_0}}$

SPACE FOR ROUGH WORK

35. A vessel of depth $2d$ cm is half filled with a liquid of refractive index μ_1 and the upper half with a liquid of refractive index μ_2 . The apparent depth of the vessel seen perpendicularly from above is
- (1) $d \left[\frac{\mu_1 \mu_2}{\mu_1 + \mu_2} \right]$ (2) $d \left[\frac{1}{\mu_1} + \frac{1}{\mu_2} \right]$
 (3) $2d \left[\frac{1}{\mu_1} + \frac{1}{\mu_2} \right]$ (4) $2d \left[\frac{1}{\mu_1 \mu_2} \right]$
36. A convex lens forms an image of an object on a screen 30 cm from the lens. When the lens is moved 90 cm towards the object, the image is again formed on the screen. Then the focal length of the lens is
- (1) 13 cm (2) 24 cm
 (3) 33 cm (4) 40 cm
37. Which one of the following is not associated with the total internal reflection.
- (1) The mirage formation
 (2) Optical fibre communication
 (3) The glittering of diamond
 (4) Dispersion of light
38. Direction of the first secondary maximum in the Fraunhofer diffraction pattern at a single slit is given by (a is the width of the slit)
- (1) $a \sin \theta = \frac{\lambda}{2}$ (2) $a \cos \theta = \frac{3\lambda}{2}$
 (3) $a \sin \theta = \lambda$ (4) $a \sin \theta = \frac{3\lambda}{2}$
39. A transistor is operated in common emitter configuration at $V_c = 2$ V such that a change in the base current from $100 \mu\text{A}$ to $300 \mu\text{A}$ produces a change in the collector current from 10 mA to 20 mA. The current gain is
- (1) 75 (2) 100
 (3) 25 (4) 50
40. A semiconductor device is connected in a series circuit with a battery and a resistance. A current is found to pass through the circuit. If the polarity of the battery is reversed, the current drops to almost zero, the device may be
- (1) extrinsic semiconductor
 (2) intrinsic semiconductor
 (3) p-n junction
 (4) p-n-p transistor
41. The work function of a metal is 1 eV. Light of wavelength 3000 \AA is incident on this metal surface. The velocity of emitted photoelectrons will be
- (1) 10 m/s (2) 1×10^3 m/s
 (3) 1×10^4 m/s (4) 1×10^6 m/s
42. Order of magnitude of density of uranium nucleus is ($m_p = 1.67 \times 10^{-27}$ kg)
- (1) 10^{20} kg/m³ (2) 10^{17} kg/m³
 (3) 10^{14} kg/m³ (4) 10^{11} kg/m³
43. Which of the following can not be polarised?
- (1) Radio waves (2) Ultraviolet rays
 (3) Infrared rays (4) Ultrasonic waves
44. Two radioactive substances A and B have decay constants 5λ and λ respectively. At $t = 0$ they have the same number of nuclei. The ratio of number of nuclei of A to those of B will be $\left(\frac{1}{e}\right)^2$ after a time interval
- (1) $\frac{1}{4\lambda}$ (2) 4λ
 (3) 2λ (4) $\frac{1}{2\lambda}$
45. When ${}_{92}\text{U}^{238}$ transforms to ${}_{85}\text{At}^{210}$, then the numbers of the emitted α and β -particles are respectively
- (1) $8\alpha, 7\beta$ (2) $7\alpha, 7\beta$
 (3) $7\alpha, 8\beta$ (4) $8\alpha, 8\beta$

CHEMISTRY

46. 3 g of activated charcoal was added to 50 mL of acetic acid solution (0.06 N) in a flask. After an hour it was filtered and the strength of the filtrate was found so be 0.042 N. The amount of acetic acid adsorbed (per gram of charcoal) is
- (1) 18 mg (2) 36 mg
 (3) 42 mg (4) 54 mg

SPACE FOR ROUGH WORK

47. 0.023 g sodium metal is reacted with 100 cm³ of water. The pH of the resulting solution is

- (1) 11 (2) 10
(3) 12 (4) 9

48. In the line spectrum of hydrogen, the lines described by the formula

$$\bar{\nu} = 109,677 \left(\frac{1}{2^2} - \frac{1}{n^2} \right) \text{cm}^{-1}$$

where, $n = \text{integer}, n \geq 3$

Constitutes

- (1) Balmer series (2) Lyman series
(3) Pfund series (4) Paschen series

49. Which one of the following statements is incorrect in relation to ionisation enthalpy?

- (1) Ionisation enthalpy increases for each successive electron
(2) The greatest increase in ionisation enthalpy is experienced on removal of electron from core noble gas configuration
(3) End of valence electrons is marked by a big jump in ionisation enthalpy
(4) Removal of electron from orbitals bearing lower n value is easier than from orbital having higher n value

50. Three sparingly soluble salt that have same solubility products are given below.

I. A₂X II. AX III. AX₃

Their solubilities order in a saturated solution will be

- (1) II > I > III (2) III > II > I
(3) III > I > II (4) II > III > I

51. Production of ammonia according to the reaction,
N₂(g) + 3H₂(g) ⇌ 2NH₃(g);

$$\Delta H = -92.38 \text{ kJ mol}^{-1}$$

is an exothermic process. At low temperature, the reaction shifts in

- (1) forward direction
(2) backward direction
(3) either forward or backward direction
(4) None of the above

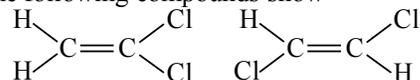
52. A mixture of *o*-nitrophenol and *p*-nitrophenol can be separated by

- (1) fractional distillation (2) sublimation
(3) chemical separation (4) steam distillation

53. Electromeric effect is a

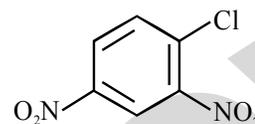
- (1) permanent effect (2) temporary effect
(3) resonance effect (4) inductive effect

54. The following compounds show



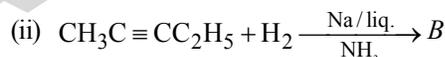
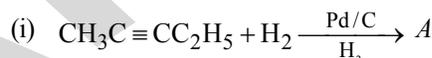
- (1) configuration isomerism
(2) conformational isomerism
(3) structural isomerism
(4) stereoisomerism

55. Write the correct IUPAC name of the following



- (1) 1-chloro-2, 4-dinitrobenzene
(2) 6-chloro-1, 3-dinitrobenzene
(3) 1-chloro-4, 6-dinitrobenzene
(4) 2-chloro-1, 5-dinitrobenzene

56. The given reactions,



A and B respectively are

- (1) *cis* and *trans*-alkene
(2) *trans* and *cis*-alkene
(3) alkane and alkene
(4) alkene and alkane

57. Ionic compounds in the crystalline state consist of orderly three-dimensional arrangements of cations and anions held together by

- (1) coulombic interaction energies
(2) electron gain energies
(3) ionisation energies
(4) None of the above

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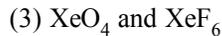
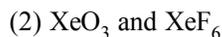
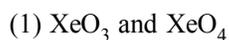
70. Arrange the following aqueous solutions in the order of their increasing boiling points.



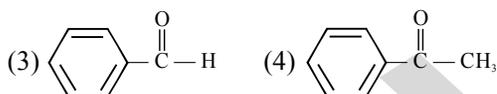
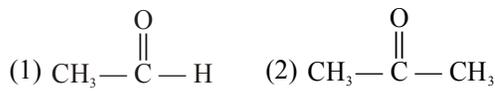
71. Which of the following compound has a P—P bond?



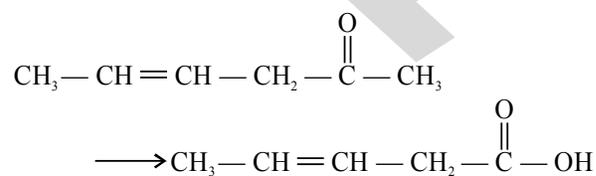
72. Among XeO_3 , XeO_4 and XeF_6 , the molecules having same number of lone pairs on Xe are



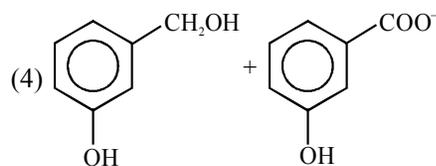
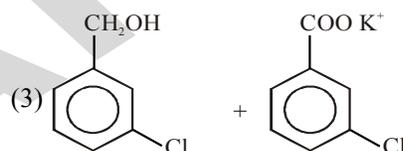
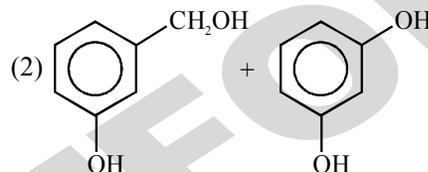
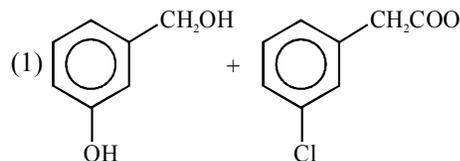
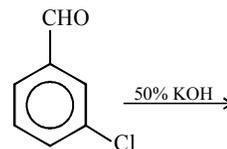
73. Which of the following compounds is most reactive towards nucleophilic addition reactions?



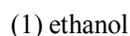
74. Which is the most suitable reagent for the following conversion?



75. Predict the products in the given reaction,

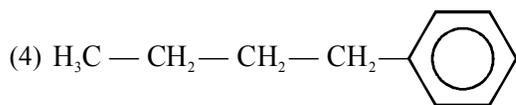
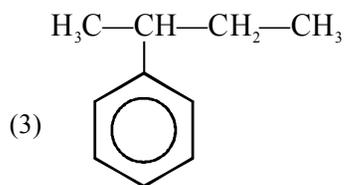
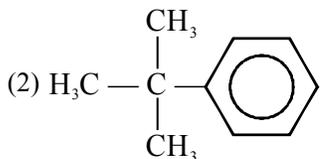
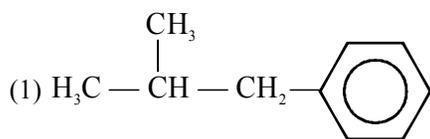


76. Phenol is less acidic than



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77. What is the major product formed during the reaction of benzene with *isobutyl* alcohol in the presence of conc. H_2SO_4 ?



78. Standard electrode potential for $\text{Sn}^{4+}/\text{Sn}^{2+}$ couple is $+0.15\text{V}$ and that for the Cr^{3+}/Cr couple is -0.74V . These two couples in their standard state are connected to make a cell. The cell potential will be

- (1) $+1.83\text{V}$ (2) $+1.19\text{V}$
(3) $+0.89\text{V}$ (4) $+0.18\text{V}$

79. For a hypothetical reaction,
 $A \longrightarrow P$

the rate constant is 0.12 s^{-1} . Which of the following statements is/are correct, if $[\text{R}]_0$ is the initial concentration?

- (1) $t_{1/2} = \frac{[\text{R}]_0}{0.12 \times 12}$ (2) $t_{1/2} = \frac{3}{2(0.12)[\text{R}]_0^2}$
(3) $t_{1/2} = \frac{0.693}{0.12}$ (4) $t_{1/2} = \frac{0.693}{0.12 \times 3}$

80. Tyndall effect is observed only when

- (1) the diameter of the dispersed particles is not much smaller than the wavelength of light used
(2) there is high difference between the refractive indices (μ) of the dispersion medium and dispersed phase
(3) refractive indices (μ) of both dispersed medium and dispersed phase are equal to each other
(4) Both (1) and (2)

81. Which of the following pairs of metals is purified by van-Arkel method?

- (1) Zr and Ti (2) Ag and Au
(3) Ni and Fe (4) Ga and In

82. General electronic configuration of actinoids is $(n-2)f^{0-14}(n-1)d^{0-2}ns^2$. Which of the following actinoids have one electron in $6d$ -orbital?

- (1) U (atomic number = 92)
(2) Np (atomic number = 93)
(3) Both (1) and (2)
(4) Am (atomic number = 95)

83. Which of the following compounds, forms the basis if *Ziegler-Natta* catalysts used to manufacture of polythene?

- (1) TiCl_4
(2) $\text{Al}(\text{CH}_3)_3$
(3) TiCl_4 with $\text{Al}(\text{CH}_3)_3$
(4) None of these

84. Which of the following arrangements does not represent the correct order of the property stated against it?

- (1) $\text{V}^{2+} < \text{Cr}^{2+} < \text{Mn}^{2+} < \text{Fe}^{2+}$ (paramagnetic behaviour)
(2) $\text{Ni}^{2+} < \text{Co}^{2+} < \text{Fe}^{2+} < \text{Mn}^{2+}$ (ionic size)
(3) $\text{Co}^{3+} < \text{Fe}^{3+} < \text{Cr}^{3+} < \text{Sc}^{3+}$ (stability in aqueous solution)
(4) $\text{Sc} < \text{Ti} < \text{Cr} < \text{Mn}$ (number of oxidation states)

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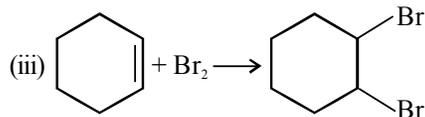
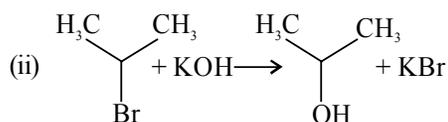
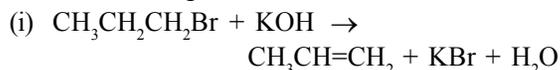
85. Which among the following will be named as dibromidobis (ethylenediammine) chromium (III) bromide?

- (1) $[\text{Cr}(\text{en})_3] \text{Br}_3$ (2) $[\text{Cr}(\text{en})_2 \text{Br}_2] \text{Br}$
 (3) $[\text{Cr}(\text{en}) \text{Br}_4]^-$ (4) $[\text{Cr}(\text{en})\text{Br}_2]\text{Br}$

86. The $M - C$ π -bond in metal carbonyl complex is formed by the

- (1) donation of a pair of electrons from metal to carbonyl
 (2) sharing of a pair of electrons
 (3) Donation a pair of electrons from carbonyl to metal d-orbital
 (4) None of the above

87. For the following reactions,



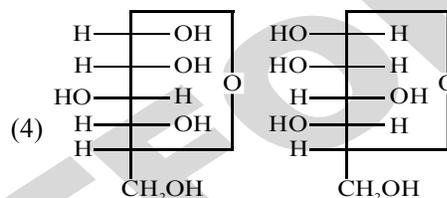
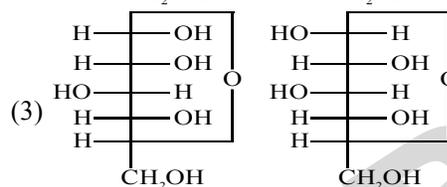
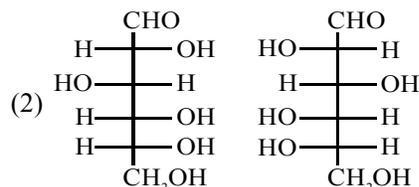
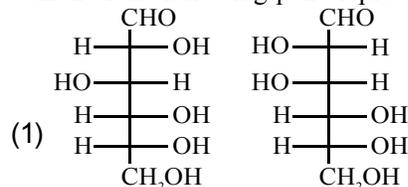
which of the following statements is correct?

- (1) (i) is elimination reaction, (ii) is substitution and (iii) is addition reaction
 (2) (i) is elimination, (ii) and (iii) are substitution reactions
 (3) (i) is substitution, (ii) and (iii) are addition reactions
 (4) (i) and (ii) are elimination reactions and (iii) is addition reaction

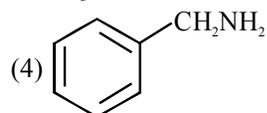
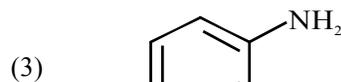
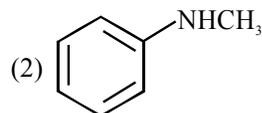
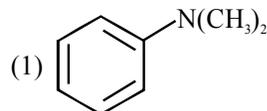
88. The correct classification of polymers based on molecular forces is

- (1) linear, branched chain and cross linked polymers
 (2) elastomers, fibres, thermoplastic and thermosetting polymers
 (3) homopolymers and copolymers
 (4) None of the above

89. Which of the following pairs represents anomers?



90. Amongst the compounds given, the one that would form a brilliant coloured dye on treatment with NaNO_2 in dil. HCl followed by addition to an alkaline solution of β -naphthol is



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BIOLOGY

- 91.** Pylorus is the constricted part of the alimentary canal which is situated in between
- (1) Oesophagus and stomach
 - (2) Stomach and duodenum
 - (3) Duodenum and ileum
 - (4) Ileum and rectum
- 92.** Which of the following statement is not correct?
- (1) Brunner's glands are present in the submucosa of stomach and secrete mucus.
 - (2) Goblet cells are present in the mucosa of intestine and secrete mucus.
 - (3) Oxyntic cells are present in the mucosa of stomach and secrete HCl
 - (4) Acini are present in the pancreas and secrete carboxypeptidase.
- 93.** Why do the eyes of the patients turns yellow during jaundice?
- (1) Due to the deposition of bile pigments
 - (2) Due to the ejection of stomach content through mouth
 - (3) Due to the stomach malfunctioning
 - (4) Due to the excessive vomiting
- 94.** The thoracic chamber is formed dorsally by the(A).... ventrally by the(B).... laterally by the(C).... and on lower side by the dome-shaped(D).....
- Select the right choices for A, B, C and D to complete the given statement.
- (1) A-vertebral column, B–sternum, C-ribs, D-diaphragm
 - (2) A-vertebral column, B–ribs, C-sternum, D-diaphragm
 - (3) A-diaphragm, B–ribs,C-sternum, D-vertebral column
 - (4) A-ribs, B–diaphragm,C-sternum, D-vertebral column
- 95.** Identify the correct statement with reference to transport of respiratory gases by blood.
- (1) Haemoglobin is necessary for the transport of carbon dioxide and carbonic anhydrase for the transport of oxygen.
 - (2) Haemoglobin is necessary for the transport of oxygen and carbonic anhydrase for the transport of carbon dioxide.
 - (3) Only oxygen is transported by blood.
 - (4) Only carbon dioxide is transported by blood.
- 96.** A few statements with regard to sexual reproduction are given below.
- (i) Sexual reproduction does not always require two individuals.
 - (ii) Sexual reproduction generally involves gametic fusion.
 - (iii) Meiosis never occurs during sexual reproduction.
 - (iv) External fertilization is the key feature of reproduction.
- Choose the **correct** statements from the options below
- (1) (i) and (iv)
 - (2) (i) and (ii)
 - (3) (ii) and (iii)
 - (4) (ii) and (iv)
- 97.** Both autonomy and geitonomy are prevented in
- (1) Papaya
 - (2) Cucumber
 - (3) Castor
 - (4) Maize
- 98.** Pollen intine made up of
- (1) Cellulose only
 - (2) Pectin and cellulose
 - (3) Sporopollenin
 - (4) chitin
- 99.** The process of transfer of pollen grains from anther to stigmatic surface of the flower with the help of water is called
- (1) Anemophily
 - (2) Zoophily
 - (3) Hydrophily
 - (4) Ornithophily
- 100.** Long silky hair coming out of the cob of maize are
- (1) meant for fruit dispersal.
 - (2) meant for attracting insects.
 - (3) meant for protecting seeds.
 - (4) long styles and stigma.

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- 101.** When a neuron is in resting state, i.e., not conducting any impulse, the axonal membrane is
- (1) equally permeable to both Na^+ and K^+ ions
 - (2) impermeable to both Na^+ and K^+ ions
 - (3) comparatively more permeable to K^+ ions and nearly impermeable to Na^+ ions
 - (4) comparatively more permeable to Na^+ ions and nearly impermeable to K^+ ions
- 102.** Injury localized to the hypothalamus would most likely disrupt
- (1) short-term memory
 - (2) co-ordination during locomotion
 - (3) executive functions, such as decision making
 - (4) regulation of body temperature
- 103.** Functional megaspore in an angiosperm develop into
- (1) Endosperm
 - (2) Embryo sac
 - (3) Embryo
 - (4) Ovule
- 104.** Plant lysosomes are
- (1) Glyoxysome
 - (2) Sphaerosome
 - (3) Tanosome
 - (4) Peroxisome
- 105.** If two persons with 'AB' blood group marry and have sufficiently large number of children, these children could be classified as 'A' blood group : 'AB' blood group : 'B' blood group in 1 : 2 : 1 ratio. Modern technique of protein electrophoresis reveals presence of both 'A' and 'B' type proteins in 'AB' blood group individuals. This is an example of
- (1) codominance
 - (2) incomplete dominance
 - (3) partial dominance
 - (4) complete dominance
- 106.** Multiple allele can be manifested only when there is the study of
- (1) individual organism
 - (2) genus
 - (3) population
 - (4) phylum
- 107.** ZZ/ZW type of sex determination is seen in
- (1) *Platypus*
 - (2) snails
 - (3) cockroach
 - (4) peacock

- 108.** Mutagens are
- (1) chemical agents which cause change in DNA
 - (2) physical agents which cause mutation
 - (3) cancer producing agents
 - (4) more than one option is correct
- 109.** Appearance of antibiotic-resistant bacteria is an example of
- (1) adaptive radiation
 - (2) transduction
 - (3) pre-existing variation in the population
 - (4) divergent evolution
- 110.** Leucocytes are colourless due to
- (1) lack of water
 - (2) lack of haemoglobin
 - (3) the presence of a white pigment
 - (4) the presence of calcium ions
- 111.** SA node is located in
- (1) upper lateral wall of left atrium
 - (2) lower lateral wall of left atrium
 - (3) lower lateral wall of right atrium
 - (4) upper lateral wall of right atrium
- 112.** Match the following columns.

Column I

- A. Heart failure
- B. Cardiac arrest
- C. Heart attack
- D. Coronary Artery Disease (CAD)
- E. Angina pectoris

Column II

1. Heart muscle is suddenly damaged by an inadequate blood supply.
2. Chest pain due to inadequate O_2 reaching the heart muscles.
3. Atherosclerosis
4. Heart not pumping blood effectively enough to meet the needs of the body.
5. Heart stops beating.

Codes

	A	B	C	D	E
(1)	4	5	1	3	2
(2)	5	4	1	3	2
(3)	4	5	1	2	3
(4)	5	4	2	3	1

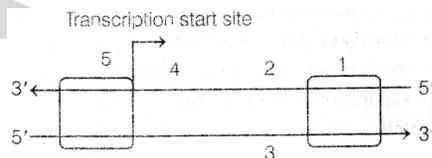
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- 113.** The part of nephron involved in active reabsorption of sodium is
 (1) distal convoluted tubule
 (2) proximal convoluted tubule
 (3) Bowman's capsule
 (4) descending limb of Henle's loop
- 114.** Order of toxicity among ammonia, urea and uric acid (from lower to higher) is
 (1) uric acid < urea < ammonia
 (2) uric acid < ammonia < urea
 (3) urea < uric acid < ammonia
 (4) ammonia < urea < uric acid
- 115.** Liquid part of the blood having undergone ultrafiltration from the glomerulus and reaching Bowman's capsule normally would not contain
 (1) sugar (glucose) (2) sodium chloride
 (3) creatinine (4) albumin
- 116.** Common cold differs from pneumonia in that
 (1) Pneumonia is communicable disease, whereas the common cold is a nutritional deficiency disease.
 (2) Pneumonia can be prevented by a live attenuated bacterial vaccine, whereas the common cold has no effective vaccine
 (3) Pneumonia is caused by virus, while the common cold is caused by the bacterium *Haemophilus influenzae*.
 (4) Pneumonia pathogen infects alveoli whereas the common cold affects nose and respiratory passage but not the lungs.
- 117.** Which is the particular type of drug that is obtained from the plant whose one flowering branch is shown below?



- (1) Hallucinogen (2) Depressant
 (3) Stimulant (4) Pain-killer

- 118.** In MOET technology, female cow is administered hormones, with _____ like activity.
 (1) Progesterone (2) ICSH
 (3) FSH (4) Testosterone
- 119.** Disorder of skeletal muscle caused by hypocalcaemia is called
 (1) Myasthenia (2) Tetany
 (3) Osteoarthritis (4) Osteoporosis
- 120.** Sarcomere is the functional unit of contraction in a muscle fibre. Identify the portion of myofibril that constitute a sarcomere
 (1) The portion of myofibril between two successive 'A' band
 (2) The portion of myofibril between two successive 'Z' band
 (3) The portion of myofibril between two successive 'M' band
 (4) The portion of myofibril between two successive 'I' band
- 121.** DNA differs from RNA in _____.
 (1) absence of - OH group at the 2'-position
 (2) presence of - OH group at the 2'-position
 (3) absence of phosphate group at the 2'-position
 (4) presence of phosphate group at the 2'-position
- 122.** In the given diagram find out



- (1) Promoter site (B) Structural gene
 (C) Terminator site (D) Template strand
 (E) Coding strand

Codes

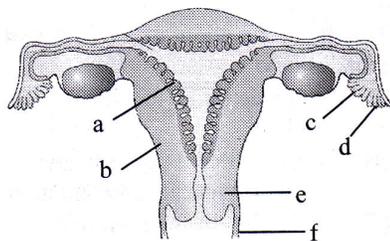
	A	B	C	D	E
(1)	5	1	4	2	3
(2)	5	1	4	3	2
(3)	5	4	1	2	3
(4)	5	4	1	3	2

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123. DNA polymerisation rate of DNA polymerase is
 (1) 1000 bp/s (2) 2000 bp/s
 (3) 3000 bp/s (4) 5000 bp/s
124. *E. coli* cells with a mutated *z* gene of the *lac* operon cannot grow in a medium containing only lactose as the source of energy because
 (1) in the presence of glucose, *E. coli* cells do not utilize lactose
 (2) they cannot transport lactose from the medium into the cell
 (3) the *lac* operon is constitutively active in these cells
 (4) they cannot synthesize functional beta galactosidase
125. 'BAC' stands for
 (1) Bacterial acquired chromosome
 (2) Bacterial artificial chromosome
 (3) Bacterial acquired cell
 (4) Bacterial artificial cell
126. Adaptive radiations refers to
 (1) power of adaptation in an individual to a variety of environment
 (2) adaptations due to geographical isolation
 (3) evolution of different species from common ancestors
 (4) migration of members of a species to different geographical area
127. The chronological order of human evolution from early to the recent is
 (1) *Australopithecus* → *Homo habilis* → *Ramapithecus* → *Homo erectus*
 (2) *Australopithecus* → *Ramapithecus* → *Homo habilis* → *Homo erectus*
 (3) *Ramapithecus* → *Australopithecus* → *Homo habilis* → *Homo erectus*
 (4) *Ramapithecus* → *Homo habilis* → *Australopithecus* → *Homo erectus*
128. The fight-or-flight reaction causes the activation of
 (1) the parathyroid glands, leading to an increased metabolic rate.
 (2) the kidney, leading to a suppression of the renin-angiotensin-aldosterone pathway.
 (3) the adrenal medulla, leading to the increased secretions of epinephrine and norepinephrine.
 (4) the pancreas, leading to a reduction in the blood sugar levels.
129. Adenohypophyseal hormone that stimulates the gonads in males and females is called
 (1) Prolactin
 (2) Luteotrophic hormone
 (3) Follicle stimulating hormone
 (4) Gonadotrophins
130. Secretin acts on the exocrine pancreas and stimulates the secretion of
 (1) HCl
 (2) salts
 (3) enzymes
 (4) water and bicarbonate ions
131. Mycorrhiza does not help host plant in :
 (1) Enhancing its phosphorus uptake capacity
 (2) Increasing its tolerance to drought
 (3) Enhancing its resistance to root pathogens
 (4) Increasing its resistance to insects
132. Match the following list of bioactive substances and their roles :
- | Bioactive Substance | Role |
|---------------------|------------------------------------------|
| A. Statin | (i) Removal of oil stains |
| B. Cyclosporin-A | (ii) Removal of clots from blood vessels |
| C. Streptokinase | (iii) Lowering of blood cholesterol |
| D. Lipase | (iv) Immuno-suppressive agent |
- Choose the correct match :
 (1) A = (ii), B = (iii), C = (i), D = (iv)
 (2) A = (iv), B = (ii), C = (i), D = (iii)
 (3) A = (iv), B = (i), C = (ii), D = (iii)
 (4) A = (iii), B = (iv), C = (ii), D = (i)

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133. The figure given below depicts a diagrammatic sectional view of the female reproductive system of humans. Which one set of three parts out of a-f have been correctly identified?

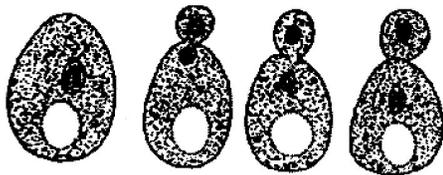


- (1) c-Infundibulum, d-Fimbriae, e-Cervix
 (2) d-Oviducal funnel, e-Uterus, f-Cervix
 (3) a-Perimetrium, b-Myometrium, c-Fallopian tube
 (4) b-Endometrium, c-Infundibulum, d-Fimbriae
134. In humans, at the end of the first meiotic division, the male germ cell differentiates into
- (1) secondary spermatocyte
 (2) primary spermatocyte
 (3) spermatogonia
 (4) spermatid
135. Gestation period is the duration
- (1) of fertilization
 (2) between egg growth and ovulation
 (3) between fertilization and parturition
 (4) none of the above
136. MTP means
- (1) Many Transferable Pregnancies
 (2) Medical Termination of Pregnancy
 (3) Medically Temporary Pregnancy
 (4) Multiple Temporary Pregnancy
137. After completing the transformation experiment involving the coding sequence of the enzyme β -galactosidase, the recombinant colonies should
- (1) Give blue colour
 (2) Not give blue colour
 (3) Have active α -galactosidase
 (4) Both (2) and (3)

138. The most commonly used bioreactor is of the stirring type. The stirrer facilitates
- (1) Temperature control (2) pH control
 (3) Oxygen availability (4) Product removal
139. The first clinical gene therapy was given for treating
- (1) Diabetes mellitus
 (2) Chicken pox
 (3) Rheumatoid arthritis
 (4) Adenosine deaminase deficiency
140. Tobacco plants resistant to a nematode have been developed by the introduction of DNA that produce (in host cells)
- (1) Both sense and antisense RNA
 (2) A particular hormone
 (3) Antifeedant
 (4) A toxic protein
141. In Polar seas, aquatic mammals have a thick layer of blubber in order to
- (1) prevent injury (2) reduce heat loss
 (3) both (1) and (2) (4) camouflage
142. The change in population size at a given time interval 't', is given by the expression
- $$N_t = N_0 + B + I - D - E$$
- where, I, B and D stand for
- (1) Immigration rate, mortality rate, natality rate
 (2) Emigration rate, natality rate, mortality rate
 (3) Mortality rate, natality rate, immigration rate
 (4) Immigration rate, natality rate, mortality rate
143. The water soluble inorganic nutrients go down into the soil horizon and get precipitated as salts. This process is called
- (1) mineralization (2) humification
 (3) leaching (4) fragmentation
144. We refer to the following as the food chain
- (1) Large number of animals near a source of food
 (2) Transfer of food energy from the green plants through a series of consumer organisms
 (3) Large number of human beings forming a human chain near a source of food
 (4) None of these

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158. Identify the type of asexual reproduction shown in the diagram given below :



- (1) Gemmule formation
- (2) Binary fission
- (3) Budding
- (4) Zoospore formation

159. Which one is the first stable compound formed by photosynthesis ?

- (1) DPGA (2) PGA
- (3) PGAld (4) DPOB

160. Which of the following is the equation of photosynthesis ?

- (1) $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 12H_2O$
- (2) $6CO_2 + 12H_2O \rightarrow C_6H_{12}O_6 + 6H_2O + 6O_2$
- (3) $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$
- (4) $6CO_2 + 18H_2O \rightarrow C_6H_{12}O_6 + 12H_2O$

161. Monoecious plant of *Chara* shows occurrence of

- (1) Antheridiophore and archegoniophore on the same plant
- (2) Stamen and carpel on the same plant
- (3) Upper antheridium and lower oogonium on the same plant
- (4) Upper oogonium and lower antheridium

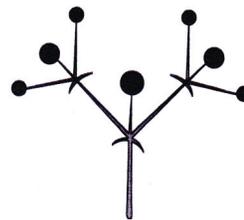
162. Which one acts as the matrix for photorespiration?

- (1) Malate (2) Glycolate
- (3) Glyoxalate (4) Fumarate

163. How many high energy phosphate bonds are present in ADP molecule?

- (1) 2 (2) 1
- (3) 3 (4) 4

164. Identify the diagram from the following figure.



- (1) Cymose inflorescence
- (2) Vexillary aestivation
- (3) Alternate phyllotaxy
- (4) Racemose inflorescence

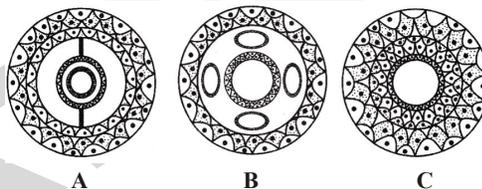
165. Which of the following is a source of medicine?

- (1) *Petunia* (2) *Amorphophalus*
- (3) *Gloriosa* (4) *Aloe*

166. Which one is **not** the part of stele?

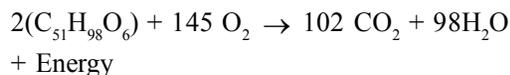
- (1) Pericycle (2) Pith
- (3) Vascular bundle (4) Cortex

167. Which one of the following figures shows coelomate condition?



- (1) A (2) B
- (3) C (4) None of these

168. Refer the given equation



The respiratory quotient in this case is

- (1) 1 (2) 0.7
- (3) 1.45 (4) 1.62

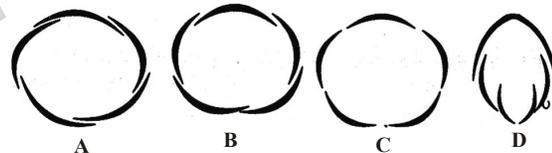
169. *Cycads* are

- (1) homosporous and dioecious
- (2) homosporous and monoecious
- (3) heterosporous and dioecious
- (4) heterosporous and monoecious

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170. Pyrenoids are made up of
- (1) core of starch surrounded by sheath of protein
 - (2) core of pretei surrounded by fatty sheath
 - (3) proteinaceous centre and starchy sheath
 - (4) core of nucleic acid surrounded by protein sheath
171. Which one of the following is a characteristic feature of group—Chrysophyta?
- (1) They are parasitic forms, which cause diseases in animals
 - (2) They have protein rich layer called pellicle
 - (3) They have indestructible wall layer deposited with silica
 - (4) They are commonly called dinoflagellates
172. Which of the following fungus is used extensively in biochemical and genetic work?
- (1) *Neurospora* (2) *Mucor*
 - (3) *Rhizopus* (4) *Aspergillus*
173. The label of a herbarium sheet does not carry information on
- (1) date of collection (2) name of collector
 - (3) local names (4) height of plant
174. The correct sequence of the rate of photosynthesis in different light is
- (1) Red > Blue > Green
 - (2) Blue > Red > Green
 - (3) Green > Blue > Red
 - (4) Green > Red > Blue
175. Imbibition is always accompanied by swelling or increase in the volume of the imbibant. However, the increase in the volume of the inbibant is
- (1) more than the volume of water imbibed
 - (2) same as the volume of water imbibed
 - (3) less than the volume of water imbibed
 - (4) depends on the type of imbibant

176. Chloroplasts without grana are known to occur in
- (1) bundle sheath cells of C_3 -plant.
 - (2) bundle sheath cells of C_4 -plant.
 - (3) mesophyll cells of C_4 -plant.
 - (4) mesophyll cells of C_3 - plant.
177. In the expression, $L_t = L_0 + rt$, of arithmetic growth rate, L_t , L_0 and r represent
- | L_t | L_0 | r |
|-------------------------|---------------------|--------------------------|
| (1) Length at time zero | Length at time 't' | Elongation per unit time |
| (2) Length at time 't' | Length at time zero | Elongation per unit time |
| (3) Length at time 't' | Length at time zero | Growth rate |
| (4) Both (2) and (3) | | |
178. Which organelle synthesises abscisic acid?
- (1) Golgi body (2) ER
 - (3) Lysosome (4) Chloroplast
179. When karyokinesis is not followed by cytokinesis, it results in the formation of
- (1) uninucleate cells (2) multinucleate cells
 - (3) undifferentiated cells (4) two cells
180. Identify the different types of aestivation (A, B, C and D) and select the correct option



- (1) A → Valvate; B → Twisted; C → Imbricate; D → Vexillary
- (2) A → Imbricate; B → Twisted; C → Valvate; D → Vexillary
- (3) A → Twisted; B → Imbricate; C → Vexillary; D → Imbricate
- (4) A → Twisted; B → Imbricate; C → Valvate; D → Vexillary

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