



collegebatch.com

click to campus

GUJCET 2022 Question Paper

Gujarat Common Entrance Exam (GUJCET)

Question Paper	Page No.
GUJCET 2022 Question Paper (Physics and Chemistry)	2 - 27
GUJCET 2022 Question Paper (Mathematics)	28 - 41
GUJCET 2022 Question Paper (Biology)	42 - 54

Download more GUJCET Previous Year Question Papers: [Click Here](#)

PHYSICS

1) An air-cored solenoid with length 30 cm, area of cross-section 25 cm^2 and number of turns 500, carries a current of 2.5A. The current is suddenly switched off in a brief time of 10^{-3} s. How much is the average back emf induced across the ends of the open switch in the circuit? Ignore the variation in magnetic field near the ends of the solenoid.

(A) 6.54 V

(B) 65.4 V

(C) 654 V

(D) 0.654 V

2) For an ideal transformer, if $N_s > N_p$ then _____.

(A) $V_s < V_p$ (B) $V_s > V_p$ (C) $V_s = V_p$

(D) None of these

3) A charged $10 \mu\text{F}$ capacitor is connected to a 16 mH inductor. What is the angular frequency of free oscillations of the circuit?

(A) 250 rad s^{-1} (B) 25 rad s^{-1} (C) 1111 rad s^{-1} (D) 2500 rad s^{-1}

(Space for Rough Work)

- 4) A light bulb is rated at 200 W for a 220 V supply. Find the resistance of the bulb
- (A) 220 Ω (B) 484 Ω
(C) 242 Ω (D) 400 Ω
- 5) A radio can tune into any station in the 6 MHz to 12 MHz band. What is the corresponding wavelength band? ($c = 3 \times 10^8$ m/s)
- (A) 40 m to 60 m (B) 25 m to 50 m
(C) 20 m to 30 m (D) 10 m to 20 m
- 6) A charged particle oscillates about its mean equilibrium position with a frequency of 10^9 Hz. What is the frequency of the electromagnetic waves produced by the oscillator?
- (A) 10^{18} Hz (B) 10^9 Hz
(C) 10^{-9} Hz (D) 10^{10} Hz
- 7) Light from a point source in air falls on a spherical glass surface ($n = 1.5$ and radius of curvature = 20 cm). The distance of the light source from the glass surface is 100 cm. Find the image distance.
- (A) -100 cm (B) -200 cm
(C) 200 cm (D) 100 cm

- 8) Double - convex lenses are to be manufactured from a glass of refractive index 1.5 with both faces of the same radius of curvature. What is the radius of curvature required if the focal length is to be 20 cm?
- (A) 44 cm (B) 2.2 cm
(C) 22 cm (D) 4.4 cm
- 9) What is the focal length of a convex lens of focal length 30 cm in contact with a concave lens of focal length 10 cm?
[Ignore thickness of lens]
- (A) - 15 cm (B) - 40 cm
(C) - 20 cm (D) - 30 cm
- 10) Unpolarised light is incident on a plane glass surface. What should be the angle of incidence so that the reflected and refracted rays are perpendicular to each other?
- (A) 56° (B) 57°
(C) 58° (D) 59°
- 11) Two slits are made 3 millimetre (3 mm) apart and the screen is placed 2 m away. What is the fringe separation when blue-green light of wavelength 600 nm is used?
- (A) 0.4 mm (B) 0.6 mm
(C) 0.5 mm (D) 0.7 mm

- 12) Estimate the distance for which ray optics is good approximation for an aperture of 5 mm and wavelength 500 nm.
- (A) 50 m (B) 18 m
(C) 40 m (D) 60 m
- 13) What is the de-Broglie wavelength associated with an electron moving with a speed of 6.4×10^6 m/s?
- [Mass of electron $m_e = 9.11 \times 10^{-31}$ kg, Planck's constant $h = 6.63 \times 10^{-34}$ J.s.]
- (A) 0.124 nm (B) 0.114 nm
(C) 0.135 nm (D) 0.145 nm
- 14) An electron, an α -particle and a proton have the same kinetic energy. Which of these particles has the shortest de-Broglie wavelength?
- (A) α -particle (B) Electron
(C) Proton (D) None of these
- 15) A difference of 5.4 eV separates two energy levels in an atom. What is the frequency of radiation emitted when the atom make a transition from the upper level to the lower level?
- [1 eV = 1.6×10^{-19} J, $h = 6.625 \times 10^{-34}$ J.s.]
- (A) 1.304×10^{15} Hz (B) 5.6×10^{15} Hz
(C) 5.6×10^{14} Hz (D) 1.304×10^{14} Hz

16) What is the shortest wavelength present in the Paschen series of spectral lines?

(A) 320 nm

(B) 720 nm

(C) 840 nm

(D) 820 nm

17) The radius of the innermost electron orbit of a hydrogen atom is 5.3×10^{-11} m. What are the radii of the $n = 3$ orbit?

(A) 4.12×10^{-10} m

(B) 4.77×10^{-10} m

(C) 2.12×10^{-10} m

(D) 2.24×10^{-10} m

18) In accordance with the Bohr's model, find the quantum number that characterises the earth's revolution around the sun in an orbit of radius 1.5×10^{11} m with orbital speed 3×10^4 m/s. (Mass of earth = 6×10^{24} kg, $h = 6.625 \times 10^{-34}$ J.s.)

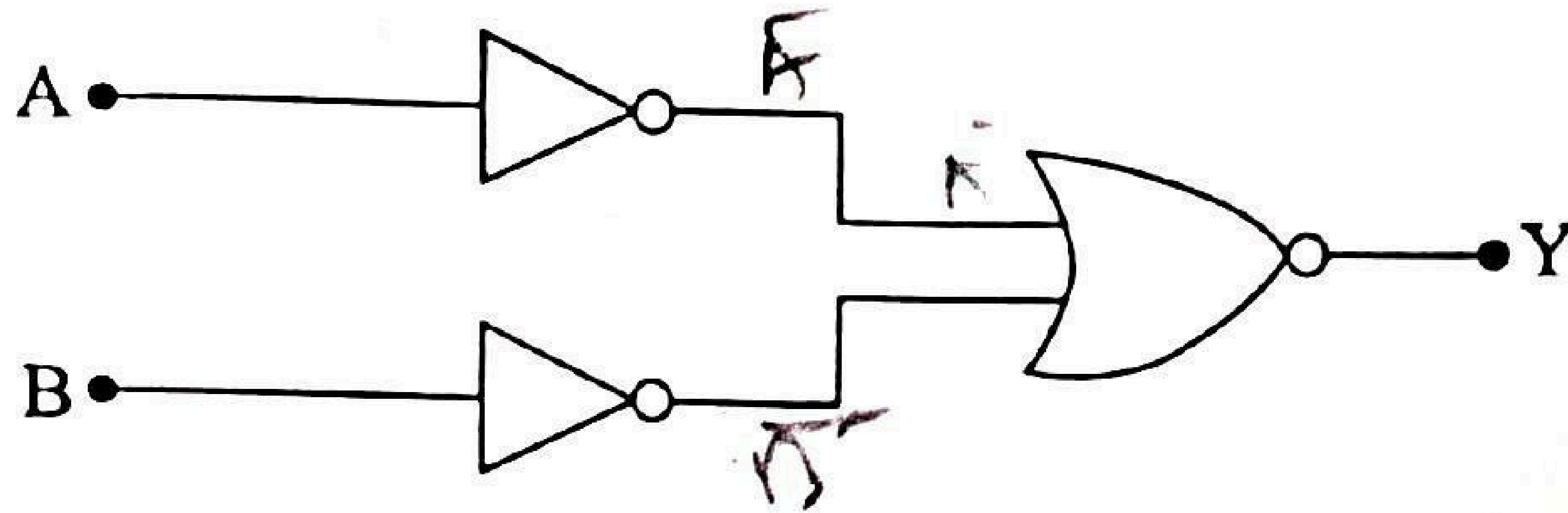
(A) 3.6×10^{74}

(B) 1.6×10^{74}

(C) 2.6×10^{74}

(D) 4.6×10^{74}

22) The circuits shown in fig. works as which gate?



- (A) NAND gate (B) OR gate
(C) AND gate (D) NOR gate

23) When a forward bias is applied to a p-n junction, it _____.

- (A) raises the potential barrier
(B) reduces the majority carrier current to zero
(C) lowers the potential barrier
(D) none of the above

24) Suppose a pure Si crystal has 5×10^{28} atoms m^{-3} . It is doped by 1 ppm concentration of pentavalent As. Calculate the number of electrons and holes.

Given that $n_i = 1.5 \times 10^{16} \text{ m}^{-3}$

- (A) $6.5 \times 10^9 \text{ m}^{-3}$ (B) $4.5 \times 10^9 \text{ m}^{-3}$
(C) $5.5 \times 10^9 \text{ m}^{-3}$ (D) $5.5 \times 10^{-9} \text{ m}^{-3}$

25) Dimensional formula of Electric flux = _____.

(A) $M^1 L^{-3} T^{-3} A^{-1}$

(B) $M^1 L^3 T^3 A^{-1}$

(C) $M^1 L^3 T^{-3} A^{-1}$

(D) $M^{-1} L^3 T^{-3} A^{-1}$

26) An electric dipole with dipole moment 4×10^{-9} cm is aligned at 60° with the direction of a uniform electric field of magnitude 5×10^4 NC⁻¹. Calculate the magnitude of the torque acting on the dipole.

(A) 17.3×10^{-5} Nm

(B) 1.73×10^{-4} Nm

(C) 1.73×10^{-5} Nm

(D) 17.3×10^{-4} Nm

27) An infinite line charge produces a field of 9×10^4 NC⁻¹ at a distance of 2 cm. Calculate Electrical field produced at a distance of 3 cm.

(A) 6×10^4 NC⁻¹

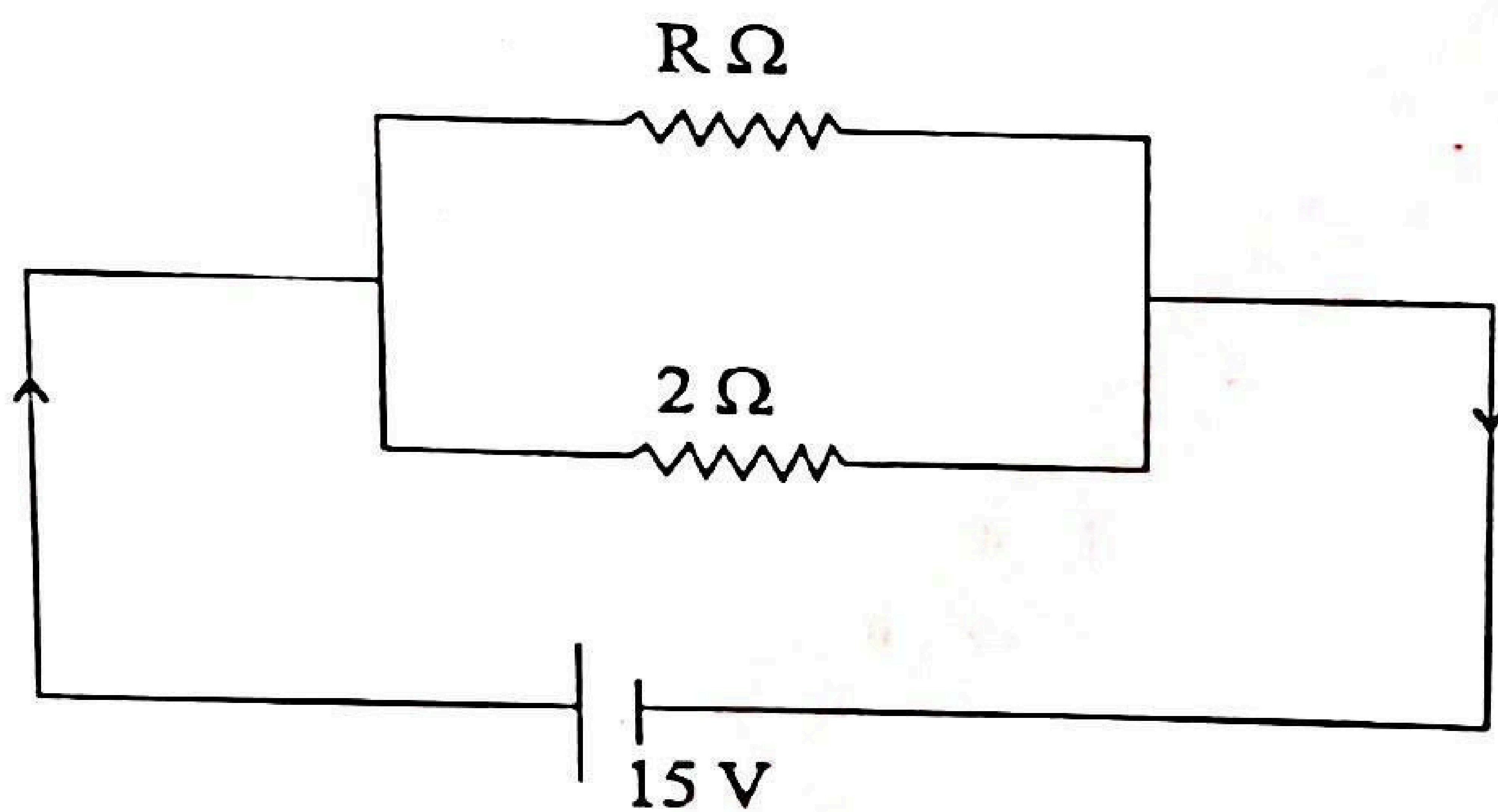
(B) 6×10^3 NC⁻¹

(C) 6×10^{-5} NC⁻¹

(D) 6×10^2 NC⁻¹

- 31) At room temperature (27°C) the resistance of a heating element is $100\ \Omega$. What is the temperature of the element if the resistance is found to be $137\ \Omega$, given that the temperature coefficient of the material of the resistor is $1.35 \times 10^{-4}\ ^\circ\text{C}^{-1}$.
- (A) 2767°C (B) 1227°C
 (C) 1027°C (D) 2327°C

32)



For the given following circuit diagram, the dissipated of electrical power $150\ \text{W}$, then find value of Resistance $R =$ _____.

- (A) $5\ \Omega$ (B) $8\ \Omega$
 (C) $6\ \Omega$ (D) $3\ \Omega$
- 33) The number density of free electrons in a copper conductor estimated $8.5 \times 10^{28}\ \text{m}^{-3}$. How long does an electron take to drift from one end of a wire $6\ \text{m}$ long to its other end? The area of cross-section of the wire is $1.0 \times 10^{-6}\ \text{m}^2$ and it is carrying a current of $1.5\ \text{A}$.
- (A) $8.1 \times 10^4\ \text{s}$ (B) $5.4 \times 10^4\ \text{s}$
 (C) $12.7 \times 10^4\ \text{s}$ (D) $4.5 \times 10^4\ \text{s}$

34) A solenoid of length 0.25 m has a radius of 1 cm and is made up of 500 turns. It carries a current of 2.5 A. What is the magnitude of the magnetic field inside the solenoid?

$$(\mu_0 = 4\pi \times 10^{-7} \text{ SI})$$

(A) $6.28 \times 10^{-3} \text{ T}$

(B) $6.28 \times 10^{-2} \text{ T}$

(C) $6.28 \times 10^{-4} \text{ T}$

(D) $6.28 \times 10^{-1} \text{ T}$

35) How the shunt wire should be ?

(A) short and thin

(B) long and thin

(C) long and thick

(D) short and thick

36) Two long and parallel straight wires A and B carrying currents of 10 A and 4 A in the same direction are separated by a distance of 2 cm. Estimate the force on a 4 cm section of wire A.

$$(\mu_0 = 4\pi \times 10^{-7} \text{ SI})$$

(A) $1.6 \times 10^{-4} \text{ N}$

(B) $1.6 \times 10^{-5} \text{ N}$

(C) $1.6 \times 10^{-6} \text{ N}$

(D) $1.6 \times 10^{-3} \text{ N}$

- 37) A solenoid has a core of a material with relative permeability 400. The windings of the solenoid are insulated from the core and carry a current of 1 A. If the number of turns is 1000 per metre, find magnetic field (B) _____ T. ($\mu_0 = 4\pi \times 10^{-7}$ SI)
- (A) $1.6\pi \times 10^{+2}$ (B) $16\pi \times 10^2$
(C) $16\pi \times 10^{-2}$ (D) $0.16\pi \times 10^{-2}$
- 38) A short bar magnet placed with its axis at 30° with a uniform external magnetic field of 0.25 T experiences a torque of magnitude equal to 4.5×10^{-2} J. What is the magnitude of magnetic moment of the magnet?
- (A) 0.36 J T^{-1} (B) 0.036 J T^{-1}
(C) 3.6 J T^{-1} (D) 36 J T^{-1}
- 39) "The polarity of induced emf is such that it tends to produce a current which opposes the change in magnetic flux that produced it." This statement is known as _____.
- (A) Faraday (B) Maxwell
(C) Kirchhoff (D) Lenz
- 40) A pair of adjacent coils has a mutual inductance of 1.5 H. If the current in one coil changes from 0 to 10 A in 0.5 s, what is the change of flux linkage with the other coil?
- (A) 30 Wb (B) 1.5 Wb
(C) 15 Wb (D) 0.15 Wb

CHEMISTRY

- 41) Hybridisation in XeF_2 and XeF_4 are respectively ____.
- (A) sp^2 and sp^3d^2 (B) sp^3d and sp^3d^2
(C) sp and sp^3 (D) sp^3d and sp^3
- 42) Which is the correct options for bonds and their number in pyrophosphoric acid?
- (A) Two P-OH, Four P=O, One P-O-P
(B) Four P-OH, One P=O, One P-O-P
(C) Two P-OH, Four P=O, Two P-O-P
(D) Four P-OH, Two P=O, One P-O-P
- 43) Name a transition element which does not exhibit variable oxidation states.
- (A) Zinc (B) Copper
(C) Scandium (D) Chromium
- 44) Which statement is incorrect from the following?
- (A) CrO is basic, but Cr_2O_3 is amphoteric
(B) 'Cd' is not consider as transition element
(C) Atomic sizes of elements of '4d' series is greater than corresponding elements of '3d' series
(D) Atomic sizes of elements of '5d' series is greater than corresponding '4d' series

45) How many numbers of Geometrical Isomers of $[\text{Pt}(\text{NH}_3)(\text{Br})(\text{Cl})(\text{Py})]$ will have?

(A) 3

(B) 2

(C) 1

(D) 4

46) How many numbers of mole Ions produced from aqueous solution of 1 mole Iron (III) hexacyanido Ferrate (II) complex?

(A) 4

(B) 7

(C) 5

(D) 6

47) Which of the following ligand is ambidentate?

NO_3^- , NO_2^- , CN^- , SCN^-
(P) (Q) (R) (S)

(A) R and S

(B) P and Q

(C) Q and S

(D) Q and R

48) How many numbers of sigma (σ) and pi (π) bonds in DDT respectively?

- (A) 28 and 6 (B) 29 and 6
(C) 30 and 6 (D) 21 and 6

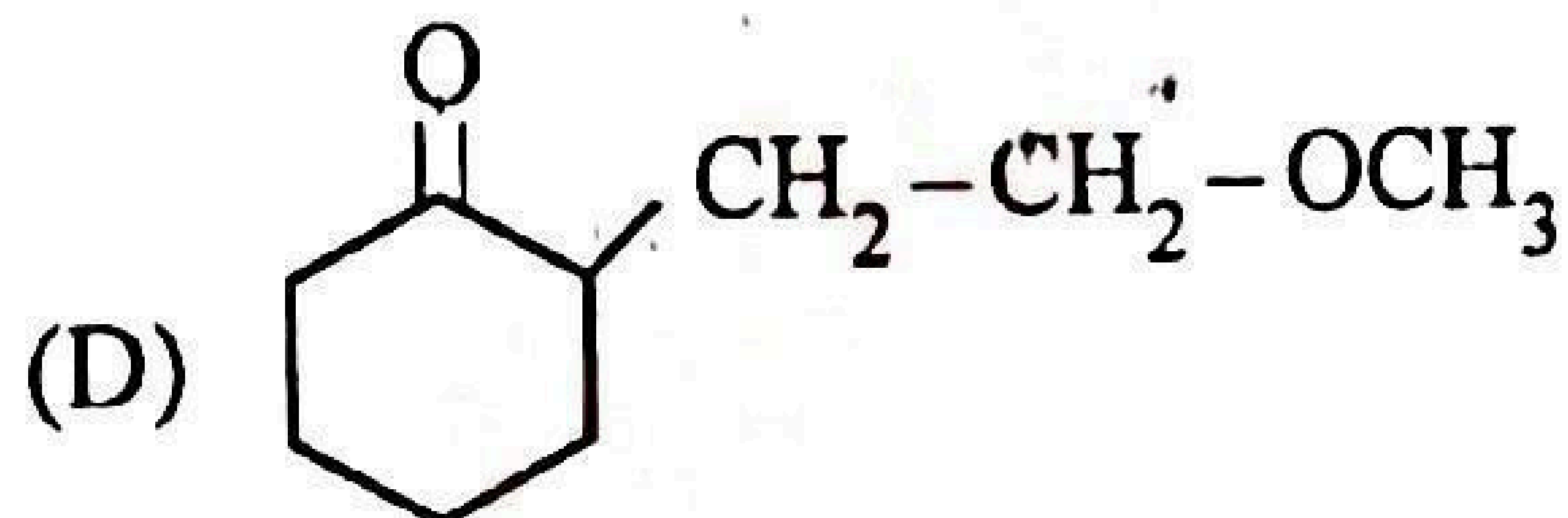
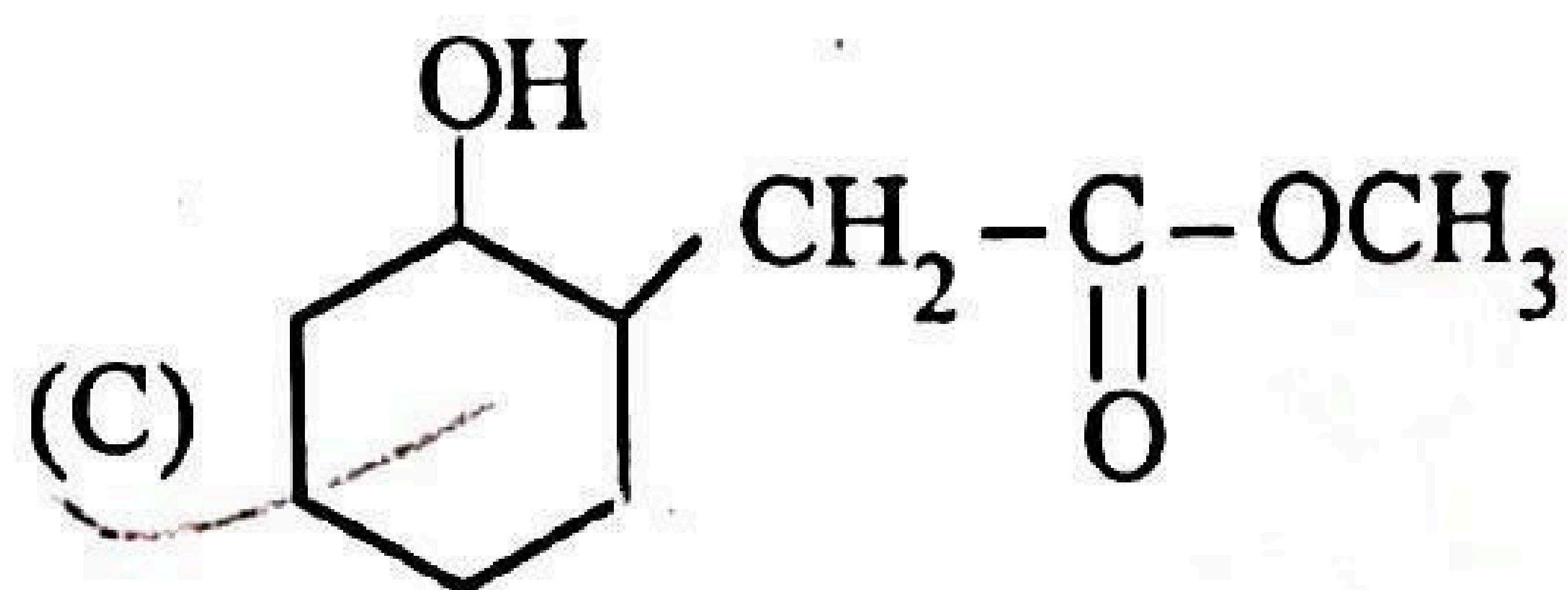
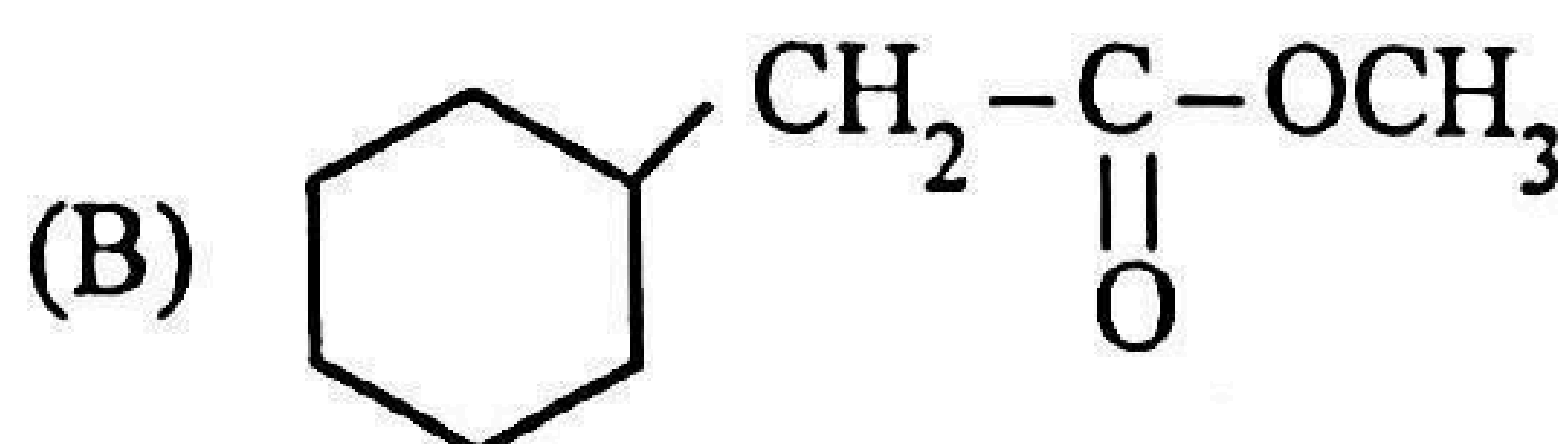
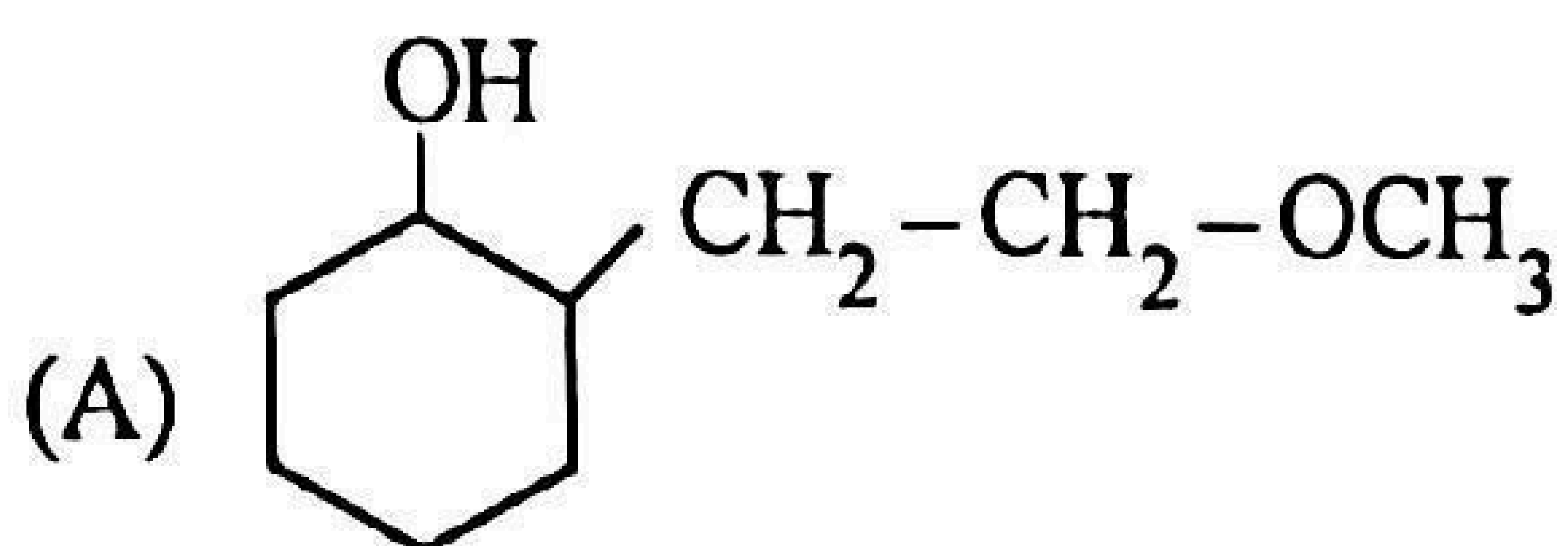
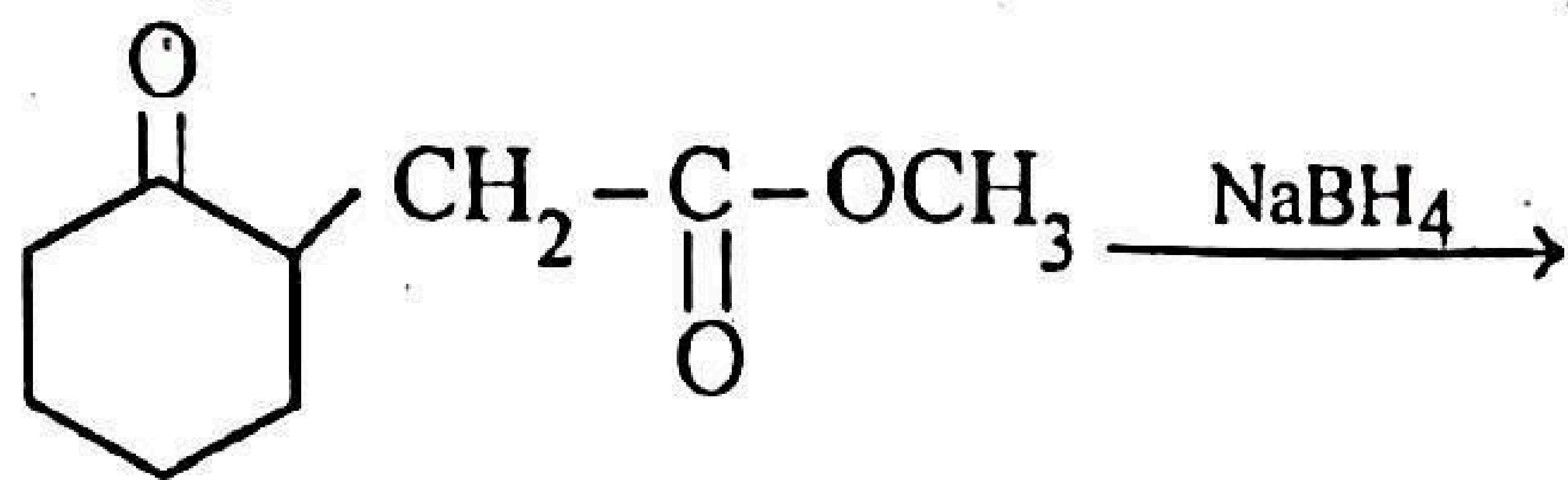
49) Which of the following undergoes S_N2 reaction most readily?

- (A) $C_6H_5CH(CH_3)Br$
(B) $C_6H_5CH(C_6H_5)Br$
(C) $C_6H_5C(CH_3)(C_6H_5)Br$
(D) $C_6H_5CH_2Br$

50) From following reactions, which reaction does not give "Benzene"?

- (A) $C_6H_5COONa + \text{Sodalime} \xrightarrow{\Delta}$
(B) $C_6H_5N_2^+Cl^- + H_3PO_2 + H_2O \longrightarrow$
(C) $C_6H_5OH + Zn \xrightarrow{\Delta}$
(D) $C_6H_5OH + H_2CrO_4 \xrightarrow{[O]}$

51) Which product is obtained from following reaction?



52) Which method is used to prepare salicylic acid from phenol?

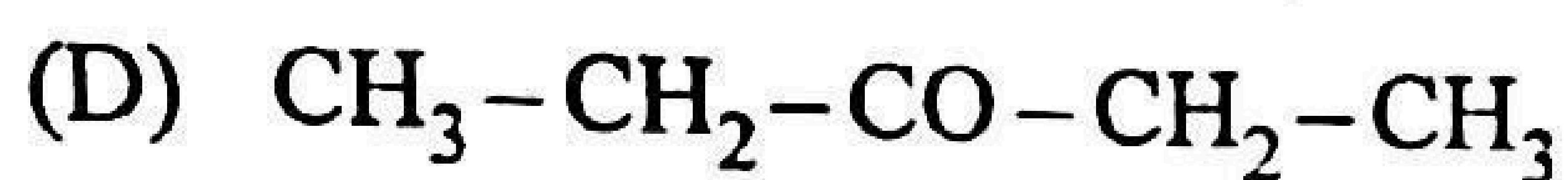
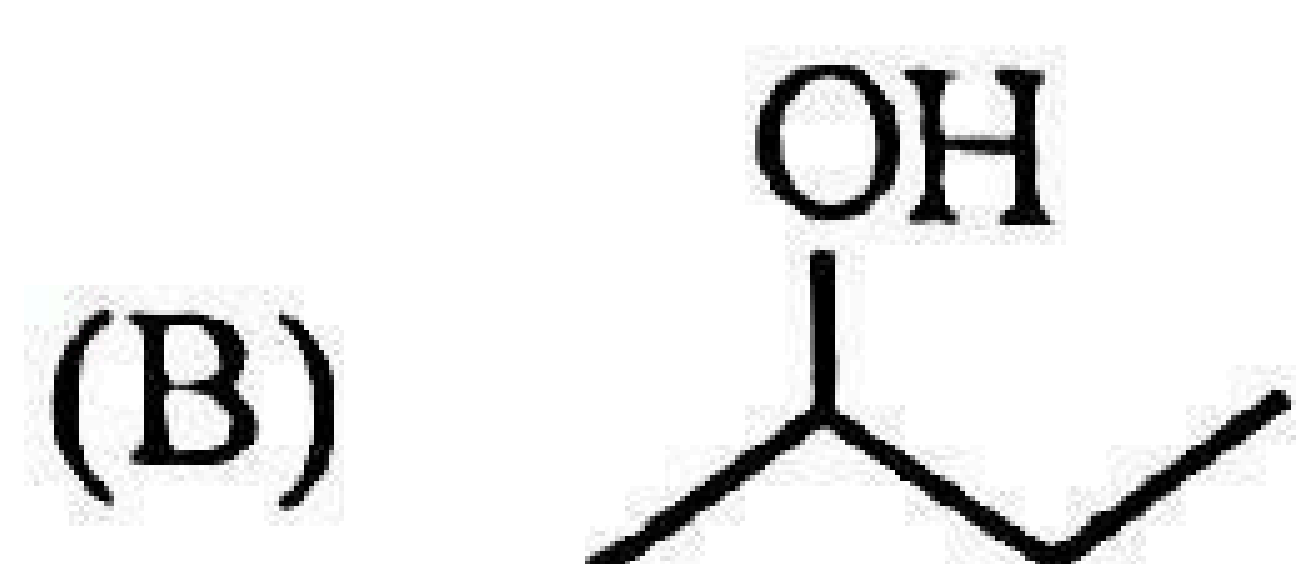
(A) Stephen reaction

(B) Kolbe's reaction

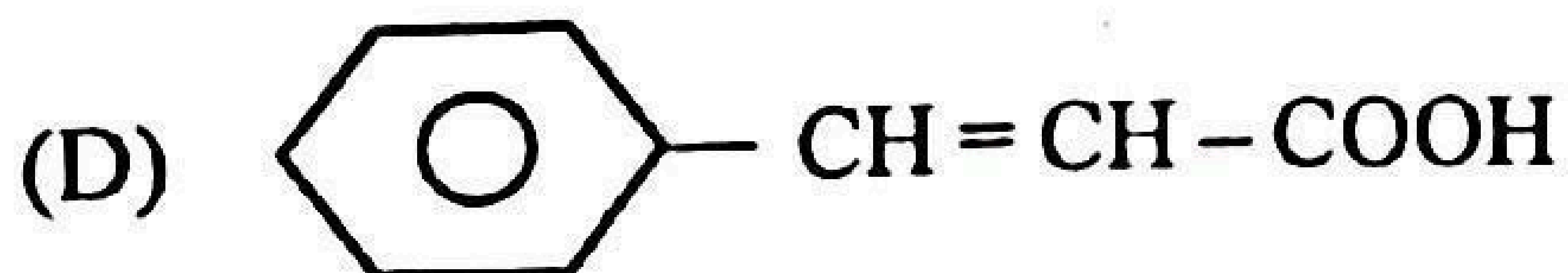
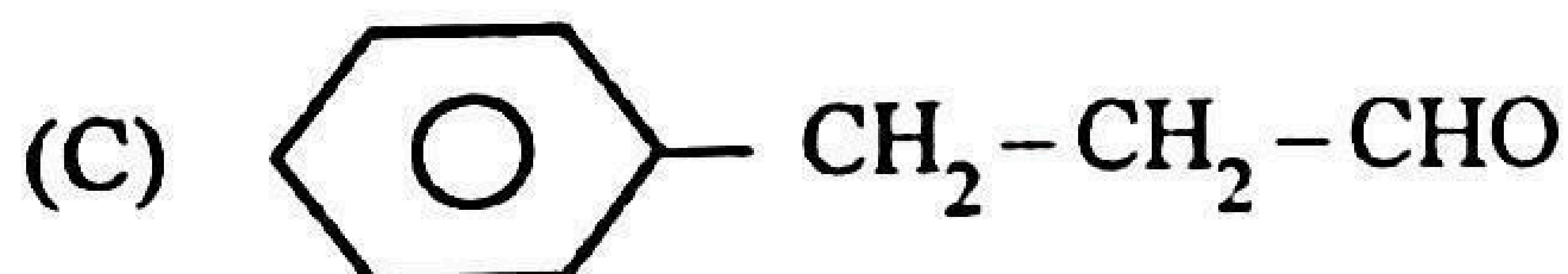
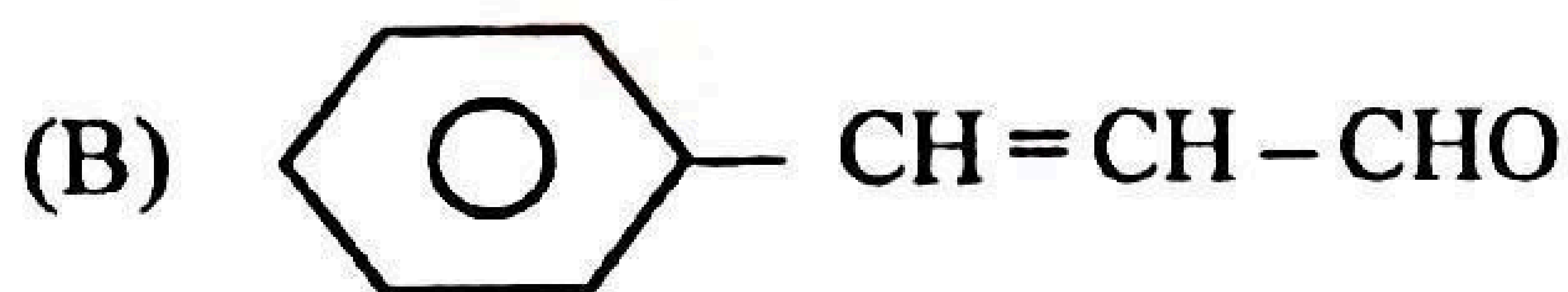
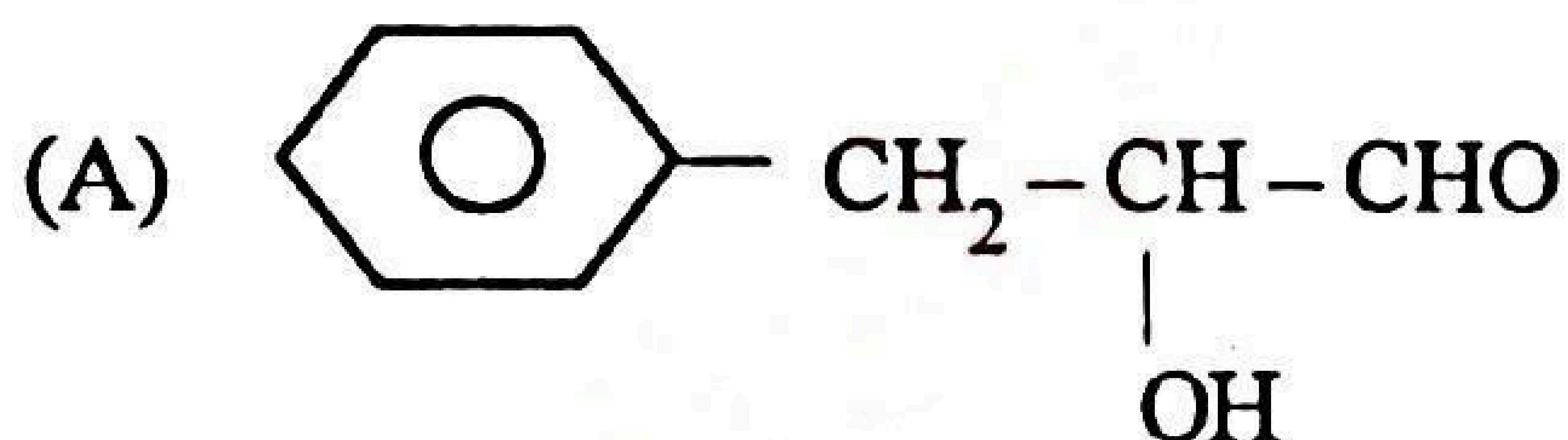
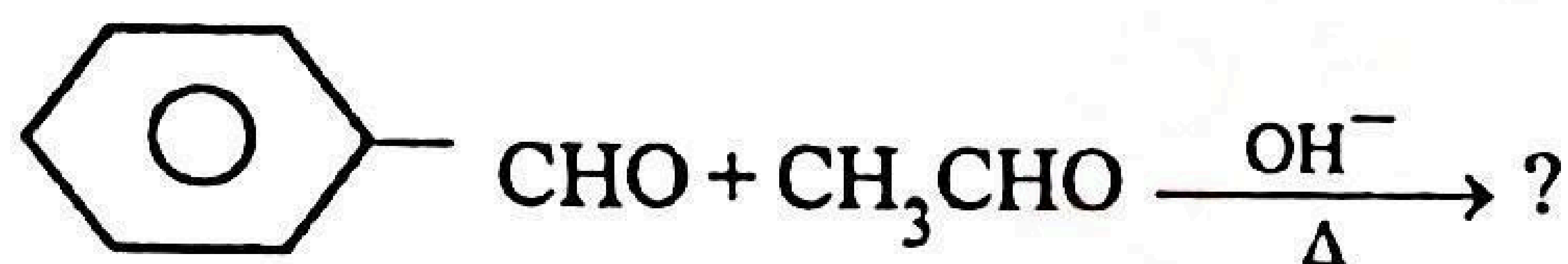
(C) Etard reaction

(D) Reimer-Tiemann reaction

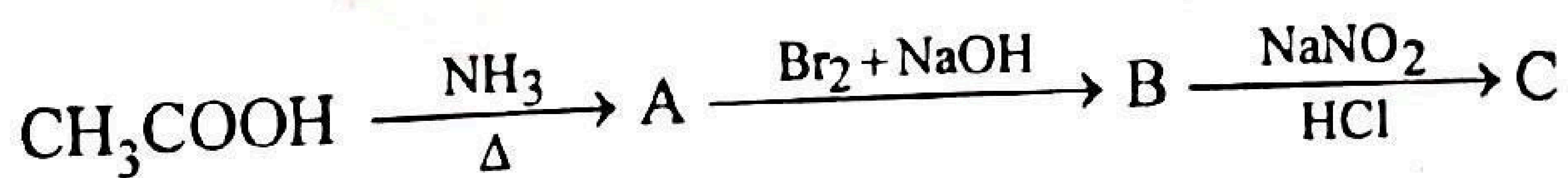
53) Which of the following compounds will not give "Iodoform" by reaction with "sodium hypoiodide"?



54) What will be the main product in the following reaction?



- 55) Which is the incorrect order of increasing acidic strength for the following?
- (A) $\text{CH}_2\text{FCH}_2\text{CH}_2\text{COOH} < \text{CH}_3\text{CHFCH}_2\text{COOH}$
- (B) $\text{CH}_2\text{ClCOOH} < \text{CH}_2\text{FCOOH}$
- (C) $\text{CH}_3\text{COOH} < \text{CH}_2\text{ClCOOH}$
- (D) $\text{HCOOH} < \text{C}_6\text{H}_5\text{COOH}$
- 56) How many numbers of Isomer for the compound having molecular formula $\text{C}_3\text{H}_9\text{N}$?
- (A) 2 (B) 3
- (C) 4 (D) 5
- 57) From which of the following reaction primary amine is produced?
- (A) Reduction of Nitrile Compounds
- (B) Reduction of Amide Compounds
- (C) Hoffmann bromamide degradation reaction
- (D) Above all reactions
- 58) Identify the compound 'C' from following reaction.



- (A) $\text{CH}_3 - \text{CH}_2\text{N}_2^+\text{Cl}^-$
- (B) $\text{CH}_3 - \text{CH}_2\text{OH}$
- (C) CH_3OH
- (D) $\text{CH}_3 - \text{CH}_2 - \text{NH}_2$

59) Select proper statement from following True (T) and False (F) statements.

(I) Pentose sugar + base \rightarrow Nucleotide

(II) Nucleotide + Phosphate \rightarrow Nucleoside

(III) DNA contains four bases A, G, C and T

(IV) RNA contains four bases A, G, C and U

(A) FTFT

(B) FTTT

(C) FFTT

(D) TTTT

60) Which glycosidic linkage occurs in 'Amylopectin'?

(A) C_1-C_3 and C_1-C_4

(B) C_1-C_4 and C_1-C_6

(C) C_1-C_2 and C_1-C_6

(D) C_2-C_4 and C_4-C_6

61) Which polymer is used in manufacture of paints and lacquers?

(A) Glyptal

(B) Teflon

(C) Neoprene

(D) Melamine

- 62) Which of the following polymer is not obtained by the condensation polymerization?
- (A) Decron
 - (B) Nylon - 2 - Nylon - 6
 - (C) Nylon - 6, 6
 - (D) Polyacrylonitrile
- 63) Which of the following drug is used for treatment of Acidity?
- (A) Ranitidine
 - (B) Meprobamate
 - (C) Salvarsan
 - (D) Codein
- 64) Which Artificial sweetener is unstable at cooking temperature?
- (A) Sucralose
 - (B) Aspartame
 - (C) Alitame
 - (D) Saccharin

- 65) Cell edge length in bcc, ccp and simple cubic unit cell is respectively as _____
- (A) $2r, \frac{4r}{\sqrt{3}}, 2\sqrt{2}r$ (B) $2r, 2\sqrt{2}r, \frac{4r}{\sqrt{3}}$
- (C) $2\sqrt{2}r, \frac{4r}{\sqrt{3}}, 2r$ (D) $\frac{4r}{\sqrt{3}}, 2\sqrt{2}r, 2r$
- 66) Atoms of element N form hcp lattice and those of the element M occupy $\frac{1}{3}$ rd of tetrahedral voids. What will be the formula of the compound formed by the element M and N?
- (A) M_4N_3 (B) M_1N_2
- (C) M_2N_3 (D) M_1N
- 67) Calculate the mole fraction of aqueous solution of 1 molal urea (NH_2CONH_2)
- (A) 0.01878 (B) 0.01768
- (C) 0.01800 (D) 0.01698
- 68) Value of Henry's constant K_H _____.
- (A) no effect by changing temperature
- (B) decreases with increase in temperature
- (C) increases with increase in temperature
- (D) first decreases and then increases by increase in temperature

- 69) What is value of Van't Hoff factor (i) when 80% of CaCl_2 dissociates?
 (A) 2.70 (B) 2.40
 (C) 3 (D) 2.30
- 70) How much electricity in terms of Faraday is required for reduction of 2 mol $\text{Cr}_2\text{O}_7^{2-}$ into Cr^{3+} in acidic medium?
 (A) 12 F (B) 3 F
 (C) 6 F (D) 9 F
- 71) Which is proper value of x for the following to increase cell potential of
 $\text{Zn}_{(s)} \mid \text{Zn}_{(x\text{M})}^{2+} \parallel \text{Cu}_{(0.02\text{M})}^{2+} \mid \text{Cu}_{(s)}$
 (A) $x = 0.02 \text{ M}$ (B) $x < 0.02 \text{ M}$
 (C) $x > 0.02 \text{ M}$ (D) $x \geq 0.02 \text{ M}$
- 72) Which substance is used as oxidising agent in nickel-cadmium cell?
 (A) $\text{Ni}(\text{OH})_3$ (B) Cd
 (C) Ni (D) CdO
- 73) What is the value of slope when graph plotted of $\log \frac{[\text{R}]_0}{[\text{R}]}$ Vs t (time) for first order reaction?
 (A) $-\frac{K}{2.303}$ (B) $\frac{K}{2.303}$
 (C) $-K$ (D) $\frac{2.303}{K}$

- 74) A reaction is first order with respect to a reactant A and second order with respect to reactant B. What is the effect of rate when concentration of both A and B increased by doubled?
- (A) Eight times (B) Quadrupled
(C) Doubled (D) Sixteen times
- 75) Which colloidal sol results, when highly diluted solution of AgNO_3 is added to highly diluted KI solution?
- (A) AgI/NO_3^- (B) AgI/K^+
(C) AgI/Ag^+ (D) AgI/I^-
- 76) Match the types of colloidal systems given in Column - I with the name given in Column - II.

<u>Column - I</u>	<u>Column - II</u>
(i) Solid in liquid	(p) Aerosol
(ii) Liquid in solid	(q) Foam
(iii) Liquid in gas	(r) Sol
(iv) Gas in liquid	(s) Gel
(A) (i) \rightarrow (r), (ii) \rightarrow (s), (iii) \rightarrow (p), (iv) \rightarrow (q)	
(B) (i) \rightarrow (s), (ii) \rightarrow (r), (iii) \rightarrow (p), (iv) \rightarrow (q)	
(C) (i) \rightarrow (r), (ii) \rightarrow (s), (iii) \rightarrow (q), (iv) \rightarrow (p)	
(D) (i) \rightarrow (p), (ii) \rightarrow (q), (iii) \rightarrow (r), (iv) \rightarrow (s)	

- 77) In which colloids both Lyophilic and Lyophobic parts present?
- (A) Micelle (B) Gold sol
(C) Rubber sol (D) Sol of As_2S_3
- 78) Which method is not proper to obtain metal of high purity from impure metal?
- (A) Leaching
(B) Chromatographic methods
(C) Liquation
(D) Distillation
- 79) Which is known as "Copper Matte"?
- (A) $\text{Cu}_2\text{S} + \text{FeO}$ (B) $\text{Cu}_2\text{S} + \text{FeS}$
(C) $\text{Cu}_2\text{O} + \text{FeS}$ (D) $\text{Cu}_2\text{O} + \text{FeO}$
- 80) Which products are obtained by reaction of hot and concentrated NaOH with dichlorine?
- (A) $\text{NaCl} + \text{NaClO}_2 + \text{H}_2\text{O}$ (B) $\text{NaCl} + \text{NaClO}_4 + \text{H}_2\text{O}$
(C) $\text{NaCl} + \text{NaClO}_3 + \text{H}_2\text{O}$ (D) $\text{NaCl} + \text{NaOCl} + \text{H}_2\text{O}$

GUJCET Physics & Chemistry

2022 Paper Answer Key (Eng)

PHYSICS (ENG) SET - 17

Question No.	Answer	Question No.	Answer
1	A	21	*
2	B	22	C
3	D	23	C
4	C	24	B
5	B	25	C
6	B	26	A,B
7	D	27	A
8	C	28	A
9	A	29	C
10	A,B	30	B
11	A	31	A
12	A	32	C
13	B	33	B
14	A	34	A
15	A	35	D
16	D	36	B
17	B	37	C
18	C	38	A
19	A	39	D
20	D	40	C

GUJCET Physics & Chemistry

2022 Paper Answer Key (Eng)

CHEMISTRY (ENG) SET - 17

Question No.	Answer	Question No.	Answer
41	B	61	A
42	D	62	D
43	C	63	A
44	D	64	B
45	A	65	D
46	B	66	C
47	A,C,D	67	B
48	B	68	C
49	D	69	*
50	D	70	A
51	C	71	B
52	B	72	A
53	D	73	B
54	B	74	A
55	D	75	D
56	C	76	A
57	D	77	A
58	C	78	A
59	C	79	B
60	B	80	C

MATHEMATICS

1) If $2\sin^{-1} x = \sin^{-1} 2x\sqrt{1-x^2}$ then $x \in$ _____.

(A) $\left[-\frac{1}{\sqrt{2}}, 1\right]$

(B) $[0, 1]$

(C) $\left[\frac{1}{\sqrt{2}}, 1\right]$

~~(D)~~ $\left[-\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right]$

2) $\cos\left(\sin^{-1}\frac{1}{5} + \cos^{-1} x\right) = 0$ then $x =$ _____.

(A) 1

~~(B)~~ $\frac{1}{5}$

(C) 0

(D) 5

3) Binary operation $*$ on \mathbb{R} is given by $a * b = \frac{a+b}{2}$. Then $*$ is _____.

(A) not commutative but associative

(B) commutative and associative

(C) commutative but not associative

(D) not commutative and not associative

(Space for Rough Work) $\frac{a+b}{2} = \frac{b+a}{2}$

24) Let $A = \{-1, -2, 3, 4\}$. Number of all one-one functions from the set A to itself is _____.

- (A) 24 (B) 16
(C) 4 ✓(D) 256

5) If functions f and g are defined as:

$$f: \left[0, \frac{\pi}{2}\right] \rightarrow \mathbb{R}, \quad f(x) = \sin x \text{ and}$$

$$g: \left[0, \frac{\pi}{2}\right] \rightarrow \mathbb{R}, \quad g(x) = \cos x$$

then _____.

- (A) $f+g$ is one-one and fg is not one-one
(B) $f+g$ is not one-one and fg is one-one
(C) $f+g$ is not one-one and fg is not one-one
✓(D) $f+g$ is one-one and fg is one-one

6) If $y = 100e^{2x} + 200e^{-2x}$ and $\frac{d^2y}{dx^2} = ay$ then $a =$ _____.

- ✓(A) 4 (B) -4
(C) 2 (D) 0

(Space for Rough Work)

Function $f : [1.2, 1.9] \rightarrow \mathbb{R}$, $f(x) = [x]$, where $[x]$ denotes the greatest integer less than or equal to x . Then _____.

(A) $f'(x) = 1$

(B) f is not differentiable

(C) $f'(x) = 0$

(D) f is not continuous function

8) If $x = \sqrt{10^{\sin^{-1}t}}$, $y = \sqrt{10^{\cos^{-1}t}}$ then $\frac{dy}{dx} =$ _____.

(A) $-\frac{x}{y}$

(B) $\frac{y}{x}$

(C) 0

(D) $-\frac{y}{x}$

9) The interval in which $y = x^2 e^{-x}$ is increasing is _____.

(A) $(0, 2)$

(B) $(-2, 0)$

(C) $(2, \infty)$

(D) $(-\infty, \infty)$

10) Equation of tangent line to $16x^2 + 25y^2 = 1$, which is parallel to Y-axis is _____

(A) $5y - 1 = 0$

(B) $5x - 1 = 0$

(C) $4y + 1 = 0$

(D) $4x - 1 = 0$

- 7) Function $f : [1.2, 1.9] \rightarrow \mathbb{R}$, $f(x) = [x]$, where $[x]$ denotes the greatest integer less than or equal to x . Then _____.
- (A) $f'(x) = 1$ (B) f is not differentiable
 (C) $f'(x) = 0$ (D) f is not continuous function
- 8) If $x = \sqrt{10^{\sin^{-1} t}}$, $y = \sqrt{10^{\cos^{-1} t}}$ then $\frac{dy}{dx} =$ _____.
- (A) $-\frac{x}{y}$ (B) $\frac{y}{x}$
 (C) 0 (D) $-\frac{y}{x}$
- 9) The interval in which $y = x^2 e^{-x}$ is increasing is _____.
- (A) $(0, 2)$ (B) $(-2, 0)$
 (C) $(2, \infty)$ (D) $(-\infty, \infty)$
- 10) Equation of tangent line to $16x^2 + 25y^2 = 1$, which is parallel to Y-axis is _____.
- (A) $5y - 1 = 0$ (B) $5x - 1 = 0$
 (C) $4y + 1 = 0$ (D) $4x - 1 = 0$

$\Delta V / \Delta t$

11) A cylindrical tank of diameter ^d 20 m is being filled with wheat at the rate of 314 cubic meter per hour. Then the depth of the wheat is increasing at the rate of ____.

- (A) 0.5 m/h
- (B) 0.1 m/h
- (C) 1.1 m/h
- (D) 1 m/h

12) $\int e^{\sin x} \sin 2x \, dx = \underline{\hspace{2cm}} + C.$

- (A) $e^{\sin x} (\sin x + 1)$
- (B) $2e^{\sin x} (\sin x - 1)$
- (C) $2e^{\sin x} (\sin x + 1)$
- (D) $e^{\sin x} (\sin x - 1)$

13) $\int \sqrt{\frac{\cos x - \cos^3 x}{1 - \cos^3 x}} \, dx = \underline{\hspace{2cm}} + C.$

- (A) $-\frac{3}{2} \cos^{-1}(\cos^{3/2} x)$
- (B) $-\frac{2}{3} \cos^{-1}(\cos^{3/2} x)$
- (C) $\frac{3}{2} \cos^{-1}(\cos^{3/2} x)$
- (D) $\frac{2}{3} \cos^{-1}(\cos^{3/2} x)$

14) $\int (x+1)(x+3)(x+2)^7 \, dx = \underline{\hspace{2cm}} + C.$

- (A) $\frac{(x+3)^{10}}{10} + \frac{(x+3)^8}{8}$
- (B) $\frac{(x+2)^{10}}{10} + \frac{(x+2)^8}{8}$
- (C) $\frac{(x+3)^{10}}{10} - \frac{(x+3)^8}{8}$
- (D) $\frac{(x+2)^{10}}{10} - \frac{(x+2)^8}{8}$

(Space for Rough Work)

15) $\int \frac{x}{(x-1)(x-2)} dx = \underline{\hspace{2cm}} + C.$

(A) $\log|(x-1)(x-2)|$

(B) $\log\left|\frac{(x-2)^2}{x-1}\right|$

(C) $\log\left|\left(\frac{x-1}{x-2}\right)^2\right|$

(D) $\log\left|\frac{(x-1)^2}{x-2}\right|$

16) $\int_{-\pi/4}^{\pi/4} \sin^2 x dx = \underline{\hspace{2cm}}.$
men

(A) $\frac{\pi}{4}$

(B) $\frac{\pi}{4} - \frac{1}{2}$

(C) $\frac{\pi}{4} - 1$

(D) $\frac{\pi}{4} + \frac{1}{2}$

17) $\int_{\frac{\pi}{2}}^{\frac{\pi}{2}} (x^{13} + \cancel{x \cos x} + \cancel{\tan^{15} x} + 1) dx = \underline{\hspace{2cm}}.$

(A) 1

(B) 2

(C) π

(D) 0

18) If $f(a+b-x) = f(x)$ then $\int_a^b x f(x) dx =$ _____.

(A) $\frac{a+b}{2} \int_a^b f(x) dx$

(B) $\frac{a+b}{2} \int_a^b f(b+x) dx$

(C) $\frac{b-a}{2} \int_a^b f(x) dx$

(D) $\frac{a+b}{2} \int_a^b f(b-x) dx$

19) $\int_0^1 \tan^{-1} \left(\frac{2x-1}{1+x-x^2} \right) dx =$ _____.

(A) $\frac{\pi}{4}$

(B) 0

(C) -1

(D) 1

20) The area of the region bounded by the two parabolas $y = x^2$ and $y^2 = x$ is _____.

(A) $\frac{3}{4}$

(B) 3

(C) $\frac{1}{2}$

(D) $\frac{1}{3}$

21) The area of the parabola $x^2 = 12y$ bounded by its latus rectum is _____.

(A) 3

(B) $\frac{24}{3}$

(C) 24

(D) $\frac{8}{3}$

22) The area of the region bounded by the curve $y^2 = 4x$ and the line $x = 3$ is _____.

(A) $3\sqrt{3}$

(B) $3\sqrt{8}$

(C) 8

(D) $8\sqrt{3}$

23) If length of subnormal at any point of a curve is always constant then that curve represents a _____.

(A) Parabola

(B) Hyperbola

(C) Ellipse

(D) Rectangular hyperbola

24) The integrating factor of the differential equation $x \frac{dy}{dx} - y = x^2$ is _____.

(A) e^{-x}

(B) $\frac{1}{x}$

(C) e^x

(D) x

- 25) If the vectors $\hat{i} - \hat{j} + \hat{k}$, $3\hat{i} + \hat{j} + 2\hat{k}$ and $\hat{i} + \lambda\hat{j} - 3\hat{k}$ are coplanar then $\lambda =$ _____.
- (A) 15 (B) -15
(C) 5 (D) $\frac{5}{3}$
- 26) Let the vectors \vec{a} and \vec{b} be such that $|\vec{a}| = 3$ and $|\vec{b}| = \frac{\sqrt{2}}{3}$. If $\vec{a} \times \vec{b}$ is a unit vector, then the angle between \vec{a} and \vec{b} is _____.
- (A) $\frac{\pi}{2}$ (B) $\frac{\pi}{4}$
(C) $\frac{\pi}{3}$ (D) $\frac{\pi}{6}$
- 27) If \vec{a} , \vec{b} , \vec{c} are unit vectors such that $\vec{a} + \vec{b} + \vec{c} = \vec{0}$ then $\vec{a} \cdot \vec{b} + \vec{b} \cdot \vec{c} + \vec{c} \cdot \vec{a} =$ _____.
- (A) $-\frac{1}{2}$ (B) $\frac{3}{2}$
(C) $\frac{1}{2}$ (D) $-\frac{3}{2}$
- 28) The angle between the line $\frac{x+1}{2} = \frac{y}{3} = \frac{z-3}{6}$ and the plane $10x + 2y - 11z = 3$ is _____.
- (A) $\cos^{-1}\left(\frac{1}{8}\right)$ (B) $\cos^{-1}\left(\frac{8}{21}\right)$
(C) $\sin^{-1}\left(\frac{8}{21}\right)$ (D) $\sin^{-1}\left(\frac{1}{8}\right)$

(Space for Rough Work)

29) The area of a triangle having the points $A(1,1,1)$, $B(1,2,3)$ and $C(2,3,1)$ as its vertices is _____.

(A) $\frac{\sqrt{19}}{2}$

(B) $\frac{\sqrt{21}}{2}$

(C) $\frac{19}{2}$

(D) $\frac{21}{2}$

30) The lines $\frac{1-x}{3} = \frac{7y-14}{2p} = \frac{z-3}{2}$ and $\frac{7-7x}{3p} = \frac{y-5}{1} = \frac{6-z}{5}$ are at right angles then value of p is _____.

(A) $\frac{11}{7}$

(B) 7

(C) $\frac{70}{11}$

(D) $\frac{7}{11}$

31) The mean number of heads in three tosses of a fair coin is _____.

(A) 3.5

(B) 0.5

(C) 15

(D) 1.5

32) If for Bernoulli distribution $B\left(10, \frac{1}{2}\right)$, it is given that $P(X \leq 2) = m\left(\frac{1}{2}\right)^{10}$ then

$m =$ _____.

(A) 101

(B) 55

(C) 56

(D) 46

(Space for Rough Work)

33) Probability that A speaks truth is $\frac{4}{5}$. A coin is tossed. A reports that a head appears.

The probability that actually there was head is _____.

(A) $\frac{2}{5}$

(B) $\frac{4}{5}$

(C) $\frac{1}{5}$

(D) $\frac{1}{2}$

34) Corner points of the feasible region of objective function $Z = 3x + 9y$ of a linear programming problem are $(0, 10)$, $(5, 5)$, $(15, 15)$ and $(0, 20)$. Minimum value of Z is _____.

(A) 70

(B) 90

(C) 50

(D) 60

35) If $A = \begin{bmatrix} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{bmatrix}$ then $A^3 =$ _____.

(A) $\begin{bmatrix} \cos 3\theta & \sin 3\theta \\ -\cos 3\theta & \sin 3\theta \end{bmatrix}$

(B) $\begin{bmatrix} -\cos 3\theta & \sin 3\theta \\ \sin 3\theta & \cos 3\theta \end{bmatrix}$

(C) $\begin{bmatrix} \cos 3\theta & \sin 3\theta \\ -\sin 3\theta & \cos 3\theta \end{bmatrix}$

(D) $\begin{bmatrix} \cos 3\theta & -\sin 3\theta \\ -\sin 3\theta & \cos 3\theta \end{bmatrix}$

(Space for Rough Work)

36) If $A = \begin{bmatrix} 1 & -1 & 1 \\ 2 & 1 & -3 \\ 1 & 1 & 1 \end{bmatrix}$, $10B = \begin{bmatrix} 4 & 2 & 2 \\ -5 & 0 & \alpha \\ 1 & -2 & 3 \end{bmatrix}$ and B is inverse of A then $\alpha =$ _____.

(A) 10

(B) 9

(C) 3

(D) 5

37) For real numbers x, y, z such that $x \neq y \neq z$, $\begin{vmatrix} x & x^2 & 1+x^3 \\ y & y^2 & 1+y^3 \\ z & z^2 & 1+z^3 \end{vmatrix} = 0$ and

$\begin{vmatrix} 1 & x & x^2 \\ 1 & y & y^2 \\ 1 & z & z^2 \end{vmatrix} \neq 0$ then $xyz =$ _____.

(A) 2

(B) -1

(C) 0

(D) 1

(Space for Rough Work)

38) If a, b, c are measurements of sides of ΔABC and $\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix} = 0$ then

$$\sin^2 A + \sin^2 B + \sin^2 C = \underline{\hspace{2cm}}.$$

(A) $\frac{13}{4}$

(B) $\frac{9}{4}$

✓(C) $\frac{15}{4}$

(D) $\frac{11}{4}$

39) If $A = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 3 \end{bmatrix}$ then sum of all the elements of $A^{-1} = \underline{\hspace{2cm}}.$

(A) 6

(B) -6

(C) 0

✓(D) $\frac{11}{6}$

40) If $\sin^{-1} a = \alpha + \beta, \sin^{-1} b = \alpha - \beta$ then $\sin^2 \alpha + \cos^2 \beta = \underline{\hspace{2cm}}.$

✓(A) ab

(B) $1 - ab$

(C) $ab - 1$

(D) $1 + ab$

(Space for Rough Work)

GUJCET Maths

2022 Paper Answer Key (Eng)

MATHS (ENG) SET - 08

Question No.	Answer	Question No.	Answer
1	D	21	C
2	B	22	D
3	C	23	A
4	A	24	B
5	C	25	A
6	A	26	B
7	C	27	D
8	D	28	C
9	A	29	B
10	D	30	C
11	D	31	D
12	B	32	C
13	D	33	B
14	D	34	D
15	B	35	C
16	B	36	D
17	C	37	B
18	A	38	B
19	B	39	D
20	D	40	D

BIOLOGY

- 1) Choose the correct option out of the following.
- (A) Butyric acid - Clostridium butylicum
 - (B) Acetic acid - Aspergillus niger
 - (C) Streptokinase - immunosuppressive agent in organ transplant
 - (D) Cyclosporine A - used as a 'clot buster' for removing clots from blood vessels
- 2) What is the BOD value per litre in sewage water?
- (A) 400 - 500 mg
 - (B) 200 - 500 mg
 - (C) 200 - 400 mg
 - (D) 500 - 600 mg
- 3) Which statements are true out of the following?
- (P) Endonuclease make cuts at specific positions within the DNA
 - (Q) A stirred - tank reactor is usually square in shape
 - (R) Bacterial cells must be first be made competent to take up DNA. This is done by treating them with divalent cation Mg^{++} .
- (A) Statement P is true
 - (B) Statements Q, R are true
 - (C) Statements P, Q are true
 - (D) Statements P, Q & R are true

(Space for Rough Work)

- 4) Statement A - DNA cannot pass through cell membrane
Reason R - DNA is a hydrophobic molecule
- (A) Statement A is correct and Reason R is wrong
(B) Statement A and Reason R both are correct because R is not the explanation of A
(C) Statement A and Reason R both are correct because R is the explanation of A
(D) Statement A is wrong and Reason R is correct
- 5) The Fragments of DNA can be separated by a technique known as _____.
- (A) Gel electrophoresis
(B) Micro injection
(C) Gene gun
(D) Biolistics
- 6) _____ infects the roots of tobacco plants and causes a great reduction in yield.
- (A) *Wuchereria bancrofti*
(B) *Bacillus thuringiensis*
(C) *Meloidogyne incognita*
(D) *Ascaris lumbricoides*

(Space for Rough Work)

- 7) In some children ADA deficiency can be cured by which transplantation?
- (A) Bone marrow
 - (B) Liver
 - (C) Kidney
 - (D) Spleen
- 8) In Rosie cow, which is nutritionally more balanced product for babies?
- (A) Beta - lactalbumin
 - (B) Alpha - lactalbumin
 - (C) Albumin
 - (D) Immunoglobulin
- 9) In which region maximum and minimum, mean annual precipitation is observed respectively?
- (A) Grassland, Desert
 - (B) Tropical forest, Temperate forest
 - (C) Tropical forest, Desert
 - (D) Coniferous forest, Temperate forest

(Space for Rough Work)

- 10) Which animal is capable of meeting all its water requirements through its internal fat oxidation?
- (A) Kangaroo rat
 - (B) Snail
 - (C) Kangaroo
 - (D) Rat
- 11) If you were to count the number of insects feeding on a big tree, what kind of pyramid would you get?
- (A) Oblique
 - (B) Inverted
 - (C) Upright
 - (D) Upright - inverted
- 12) Which stage of plant succession stage is shown in the given diagram?



- (A) Phytoplankton
- (B) Submerged plant stage
- (C) Reed - swamp stage
- (D) Submerged free floating plant stage

(Space for Rough Work)

- 13) "That within a region species richness increased with increasing explored area, but only upto a limit." Which naturalist has proposed this statement?
- (A) Paul Ehrlich
 - (B) David Tilman
 - (C) Alexander von Humboldt
 - (D) Trashow
- 14) Which species extinction in the last 500 years was due to over exploitation by humans?
- (A) Quagga
 - (B) Dodo
 - (C) Steller's sea cow
 - (D) Thylacine
- 15) Which nutrient is absent in dirty water of sewage?
- (A) Nitrate
 - (B) Ammonia
 - (C) Sodium
 - (D) Copper
- 16) What is the unit of measurement of thickness of ozone layer?
- (A) DU
 - (B) DB
 - (C) DO
 - (D) DN

(Space for Rough Work)

17) Absence of teeth, bifid tongue and mental retardness are observed in _____.

- (A) Down's syndrome
- (B) Albinism
- (C) Klinefelter's syndrome
- (D) Oral-facial-digital syndrome

18) Match the following. Choose the correct option.

	Column - I		Column - II
(i)	Conidia	(P)	Sponges
(ii)	buds	(Q)	Penicillium
(iii)	offset	(R)	Water hyacinth
(iv)	Gemmules	(S)	Hydra

- (A) (i-Q) (ii-S) (iii-R) (iv-P)
- (B) (i-Q) (ii-R) (iii-S) (iv-P)
- (C) (i-P) (ii-S) (iii-R) (iv-Q)
- (D) (i-S) (ii-Q) (iii-P) (iv-R)

19) Chromosome numbers in rice leaf is X and chromosome numbers in egg of rat is Y.

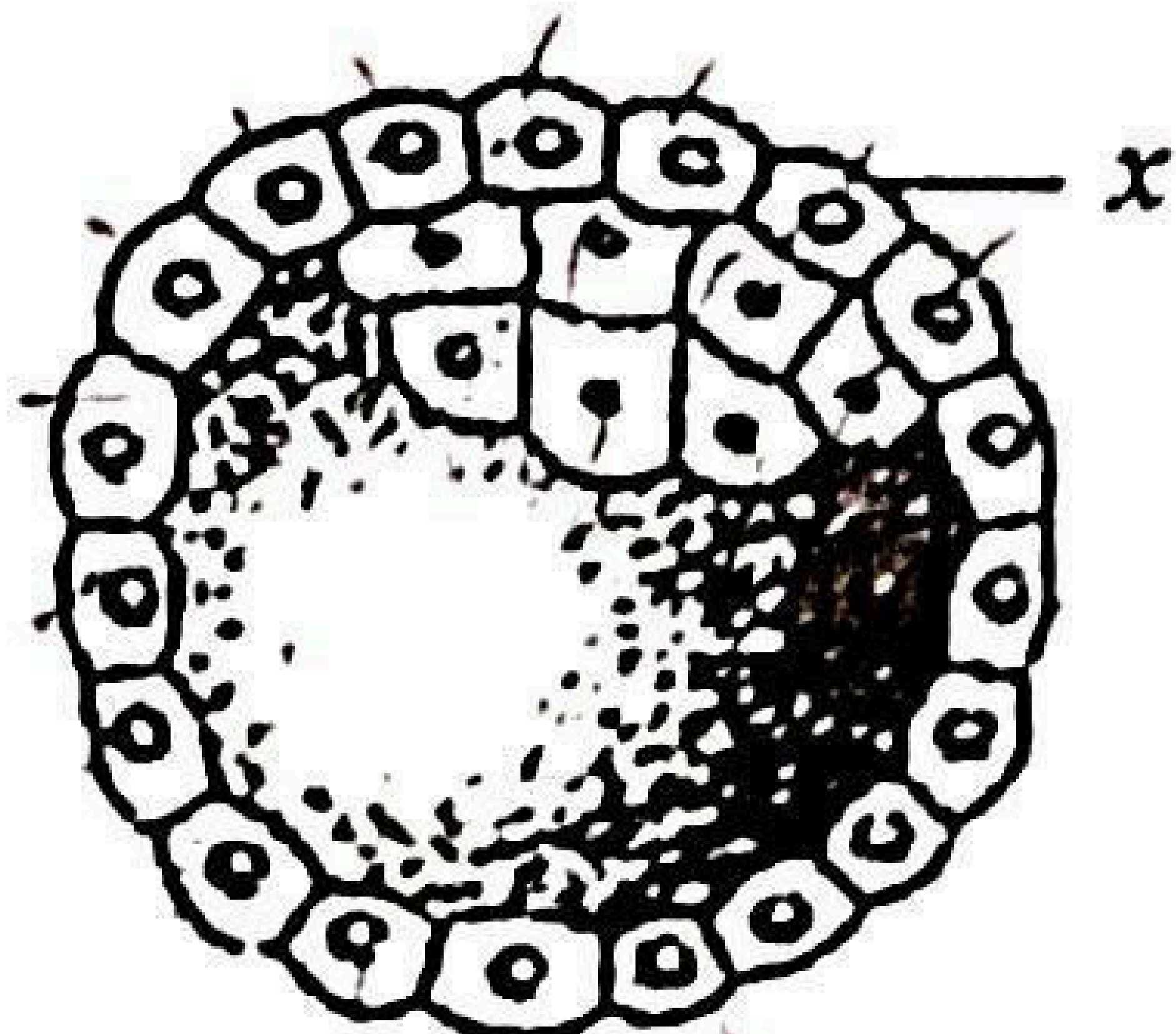
- (A) $X = 34, Y = 21$
- (B) $X = 12, Y = 24$
- (C) $X = 24, Y = 21$
- (D) $X = 20, Y = 24$

(Space for Rough Work)

- 20) Which type of carpel is observed in Michelia?
- (A) Bicarpellary, syncarpous
 - (B) Multicarpellary, apocarpous
 - (C) Multicarpellary, syncarpous
 - (D) Bicarpellary, apocarpous
- 21) In water hyacinth and water lily, the pollination is carried out by which agent?
- (A) Water
 - (B) Only wind
 - (C) Only insects
 - (D) Insects or wind
- 22) In black pepper remnants of nucellus persistent is known as _____.
- (A) Embryo
 - (B) Endosperm
 - (C) Perisperm
 - (D) Plumule
- 23) _____ hormone acts on the sertoli cells and stimulates secretion of some factors which help in the process of spermiogenesis.
- (A) TSH
 - (B) FSH
 - (C) LH
 - (D) PIF

(Space for Rough Work)

24) What indicates 'x' in the following diagram?



- (A) Trophoblast (B) Inner cell mass
(C) Blastomeres (D) Uterine cells

25) Zona Pellucida is first observed in _____.

- (A) Tertiary follicle (B) Secondary follicle
(C) Primary follicle (D) Graafian follicle

26) The hormone releasing IUD is _____.

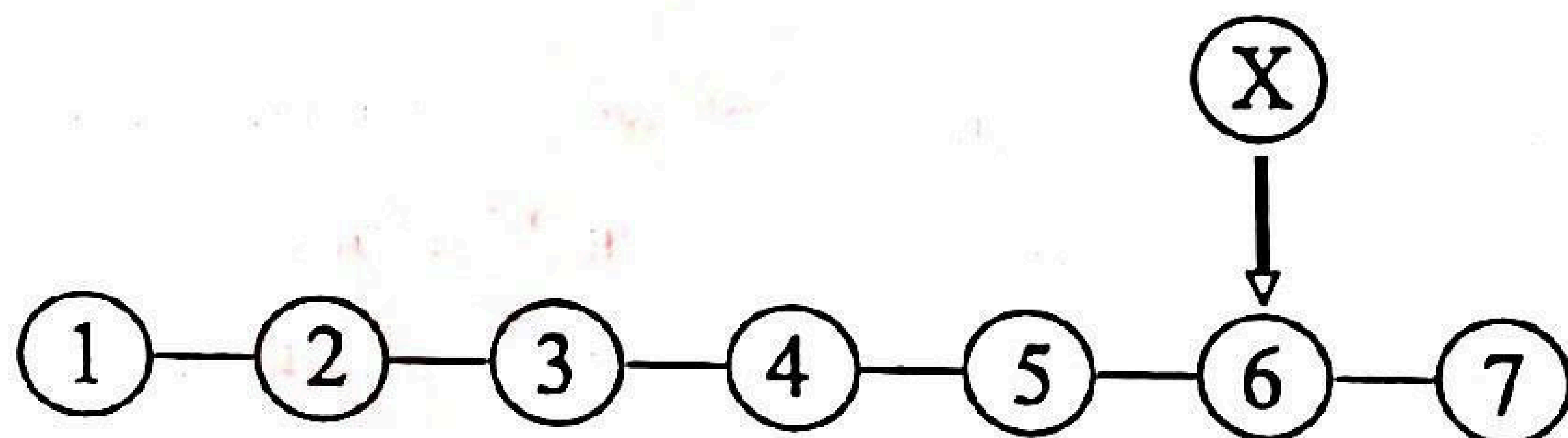
- (A) Multiload 375
(B) Cu-7
(C) LNG-20
(D) Cu-T

27) In which ART method more than 8 blastomeres are transferred into the uterus to complete its further development?

- (A) IUI
(B) IUT
(C) GIFT
(D) ZIFT

(Space for Rough Work)

- 28) The blood group of Rameshbhai is B and his daughter's blood group is AB. What will be the blood group of his wife?
- (A) B or O
(B) A or AB
(C) A or B
(D) A or O
- 29) "The behaviour of chromosomes was parallel to the behaviour of genes" was proposed by _____.
- (A) Walter Sutton and Theodor Boveri
(B) Alfred Hershey and Martha Chase
(C) Watson and Crick
(D) MacLeod and McCarty
- 30) Choose the correct triplet codon option for 'X'.



[Sickle cell HbS peptide]

- (A) GAU
(B) GAG
(C) GUG
(D) GAA

(Space for Rough Work)

- 31) Histone proteins are rich in _____ and _____ amino acids.
- (A) Lysine, Arginine
 - (B) Arginine, Tyrosine
 - (C) Lysine, Aspartic acid
 - (D) Glutamic acid, Lysine
- 32) What is the correct sequence to transfer genetic material from virus to bacteria in Hershey - Chase experiment?
- (A) Infection - Centrifugation - Blending
 - (B) Centrifugation - Blending - Infection
 - (C) Centrifugation - Infection - Blending
 - (D) Infection - Blending - Centrifugation
- 33) In Meselson and Stahl's experiment if E.coli was allowed to grow for 80 minutes then what would be the proportions of light and intermediate density of DNA molecule respectively? (If E.coli divides in every 20 minutes)
- (A) 12 : 2
 - (B) 6 : 2
 - (C) 2 : 2
 - (D) 14 : 2

(Space for Rough Work)

- 34) The brain capacity of Homo habilis is _____.
- (A) 1400cc - 1600cc
 - (B) 1350cc - 1400cc
 - (C) 650cc - 800cc
 - (D) 900cc - 1200cc
- 35) In Gir forest out of 100 individuals 40 individuals are recessive. Calculate the percentage of heterozygous progeny by Hardy - Weinberg principle.
- (A) 48%
 - (B) 16%
 - (C) 36%
 - (D) 24%
- 36) The _____ test confirmed the disease caused by salmonella typhi.
- (A) ELISA Test
 - (B) Widal Test
 - (C) W.B. Test
 - (D) PCR Test
- 37) _____ quickly reduce the symptoms of allergy.
- (A) Serotonin
 - (B) Heparin
 - (C) Adrenaline
 - (D) Histamine

(Space for Rough Work)

-
- 38) When ready - made antibodies are directly given to protect the body against foreign agents, it is called _____.
- (A) Humoral immune response
 - (B) Cytoplasm mediated immunity
 - (C) Cell mediated immunity
 - (D) Passive immunity
- 39) Which of the following crop of Okra (Bhindi) is insect pest resistance?
- (A) Pusa Sawani
 - (B) Pusa Sem
 - (C) Pusa Gaurav
 - (D) Pusa Komal
- 40) Which statement is incorrect for successful Bee-keeping?
- (A) Management of beehives during any one season
 - (B) Knowledge of the nature and habits of bees
 - (C) Selection of suitable location for keeping the beehives
 - (D) Catching and hiving of swarms

(Space for Rough Work)

GUJCET Biology

2022 Paper Answer Key (Eng)

BIOLOGY (ENG) SET - 17

Question No.	Answer	Question No.	Answer
1	A	21	D
2	C	22	C
3	A	23	B
4	A	24	A
5	A	25	D
6	C	26	C
7	A	27	B
8	B	28	B
9	C	29	A
10	A	30	C
11	B	31	A
12	B	32	D
13	C	33	D
14	C	34	C
15	D	35	A
16	A	36	B
17	D	37	C
18	A	38	D
19	C	39	A
20	B	40	A