

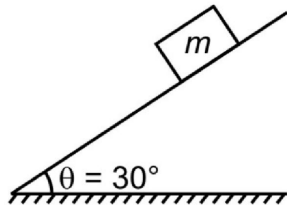
CONQUEST TEST PAPER

Time : 1 : 15 Hr.

Question : 60

PHYSICS

01. Plane having inclination 30° . The coefficient of friction between the block and the inclined plane is 0.75. The contact force on the block is-

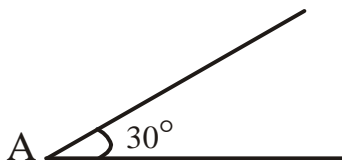


- (1) $\frac{3}{4}mg$ (2) $2mg$ (3) $\frac{5}{4}mg$ (4) mg

02. A particle of mass 5 m at rest suddenly breaks on its own into three fragments. Two fragments of mass m each move along mutually perpendicular direction with speed v each. The energy released during the process is

- (1) $\frac{3}{5}mv^2$ (2) $\frac{5}{3}mv^2$
 (3) $\frac{3}{2}mv^2$ (4) $\frac{4}{3}mv^2$

03. A sphere of mass 2 kg and radius 0.5 m is rolling with an speed of 1 ms^{-1} goes up an inclined plane which makes an angle of 30° with the horizontal plane, without slipping. How long will the sphere take to return to the starting point A?



- (1) 0.60 s (2) 0.52 s
 (3) 0.57 s (4) 0.80 s

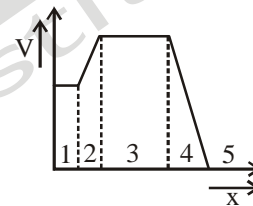
04. You measure two quantities as $A = (1.0 \pm 0.2) \text{ m}$ and $B = (2.0 \pm 0.2) \text{ m}$. You should report correct value for \sqrt{AB} as

- (1) $(1.4 \pm 0.4) \text{ m}$ (2) $(1.41 \pm 0.15) \text{ m}$
 (3) $(1.4 \pm 0.3) \text{ m}$ (4) $(1.4 \pm 0.2) \text{ m}$

05. The inward and outward electric flux for a closed surface in units of $\text{N}\cdot\text{m}^2/\text{C}$ are respectively 8×10^3 and 4×10^3 . Then the total charge inside the surface is [where $\epsilon_0 =$ permittivity constant]

- (1) $4 \times 10^3 \text{ C}$ (2) $-4 \times 10^3 \text{ C}$
 (3) $\frac{(-4 \times 10^3)}{\epsilon_0} \text{ C}$ (4) $-4 \times 10^3 \epsilon_0 \text{ C}$

06. The figure gives the electric potential V as a function of distance through five regions on x-axis. Which of the following is true for the electric field E in these regions?



- (1) $E_2 = E_4, E_5 = 0$ (2) $E_1 = E_3 = E_5 = 0$
 (3) $E_2 = E_4 = E_5$ (4) $E_1 < E_2 < E_3 < E_4 < E_5$

07. Copper of fixed volume 'V' is drawn into wire of area 'A'. When this wire is subjected to a constant force 'F', the extension produced in the wire is ' Δl '. Which of the following graphs is a rectangular hyperbola?

- (1) Δl versus $1/A^2$
 (2) Δl versus A
 (3) Δl versus $1/A$
 (4) Δl versus A^2

08. A body of mass 1 kg begins to move under the action of a time dependent force $\vec{F} = (2t\hat{i} + 3t^2\hat{j}) \text{ N}$, where \hat{i} and \hat{j} are unit vectors along x- and y-axes. What power will be developed by the force at the time t?

- (1) $(2t^2 + 3t^3) \text{ W}$
 (2) $(2t^2 + 4t^4) \text{ W}$
 (3) $(2t^3 + 3t^4) \text{ W}$
 (4) $(2t^3 + 3t^5) \text{ W}$

09. Let \vec{F} be the force acting on particle having position vector \vec{r} and $\vec{\tau}$ be the torque of this force about the origin. Then :

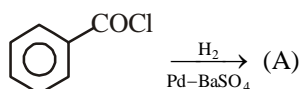
- (1) $\vec{r} \cdot \vec{\tau} = 0$ and $\vec{F} \cdot \vec{\tau} \neq 0$
- (2) $\vec{r} \cdot \vec{\tau} \neq 0$ and $\vec{F} \cdot \vec{\tau} = 0$
- (3) $\vec{r} \cdot \vec{\tau} \neq 0$ and $\vec{F} \cdot \vec{\tau} \neq 0$
- (4) $\vec{r} \cdot \vec{\tau} = 0$ and $\vec{F} \cdot \vec{\tau} = 0$

10. A thin uniform rod of length l and mass m is swinging freely, about a horizontal axis passing through its end. Its maximum angular speed is ω . The maximum height, to which its centre of mass rises, is

- (1) $\frac{1}{3} \frac{l^2 \omega^2}{g}$
- (2) $\frac{1}{6} \frac{l \omega}{g}$
- (3) $\frac{1}{2} \frac{l^2 \omega^2}{g}$
- (4) $\frac{1}{6} \frac{l^2 \omega^2}{g}$

CHEMISTRY

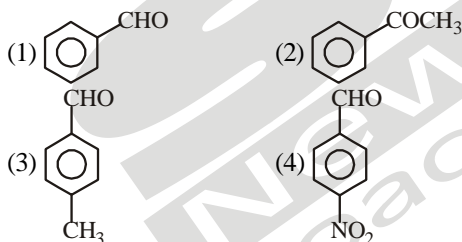
11. Consider the following reaction,



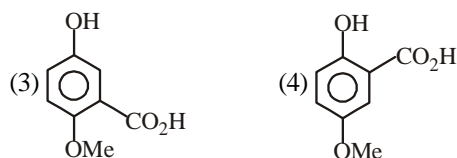
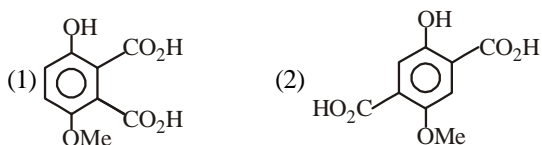
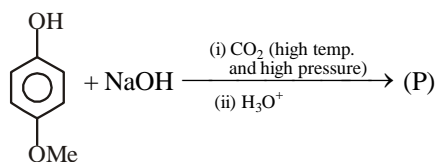
The product (A) is:

- (1) $\text{C}_6\text{H}_5\text{OH}$
- (2) $\text{C}_6\text{H}_5\text{CHO}$
- (3) $\text{C}_6\text{H}_5\text{COCH}_3$
- (4) $\text{C}_6\text{H}_5\text{Cl}$

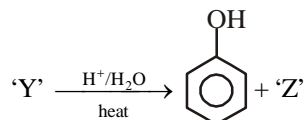
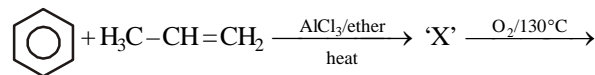
12. Which one is most reactive towards nucleophilic addition reaction:



13. The structure of the product (P) of the following reaction is:

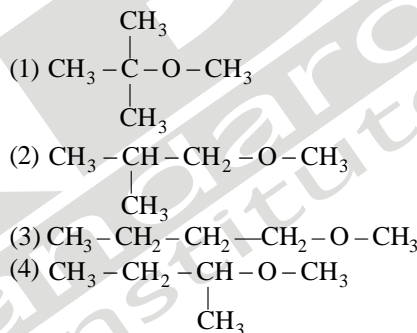


14. The products 'X' and 'Z' in the following sequence are:



- (1) cumene peroxide and acetone
- (2) iso-propyl benzene and iso-propyl alcohol
- (3) iso-propyl benzene and acetone
- (4) phenol and acetone

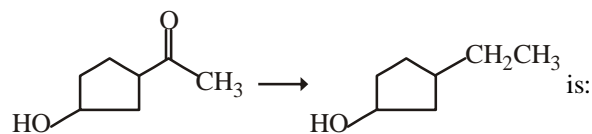
15. Among the following ethers, which one will produce methyl alcohol on treatment with hot concentrated HI?



16. Which of the following oxidation numbers is not correctly matched?

- (1) P in $\text{NaH}_2\text{PO}_4 = +5$
- (2) Ni in $[\text{Ni}(\text{CN})_6]^{4-} = +2$
- (3) P in $\text{Mg}_2\text{P}_2\text{O}_7 = +6$
- (4) Cr in $(\text{NH}_4)_2\text{Cr}_2\text{O}_7 = +6$

17. The appropriate reagent for the following transformation,

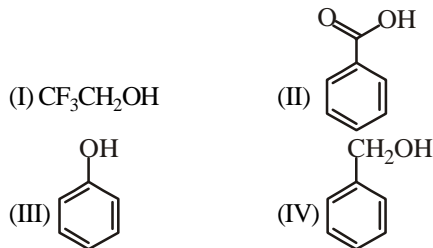


- (1) $\text{Zn}(\text{Hg}), \text{HCl}$
- (2) $\text{NH}_2\text{NH}_2, \text{OH}^-$
- (3) H_2/Ni
- (4) NaBH_4

18. CH_3CHO and $\text{C}_6\text{H}_5\text{CH}_2\text{CHO}$ can be distinguished chemically by:

- (1) Benedict's test
- (2) Iodoform test
- (3) Tollen's reagent test
- (4) Fehling's solution test

19. Which is the correct order of acidity from weakest to strongest acid for these compounds?



- (1) $\text{IV} < \text{I} < \text{III} < \text{II}$
- (2) $\text{III} < \text{IV} < \text{I} < \text{II}$
- (3) $\text{I} < \text{IV} < \text{III} < \text{II}$
- (4) $\text{II} < \text{III} < \text{I} < \text{IV}$

20. Acetic acid is treated with $\text{Ca}(\text{OH})_2$ and the product so obtained is subjected to dry distillation. The final product is:

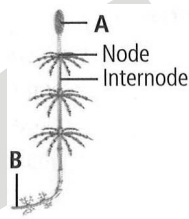
- (1) propanal
- (2) propanone
- (3) ethanal
- (4) ethanol

BOTANY

21. Select the incorrect statement regarding reproduction in Rhodophyceae.

- (1) Asexual reproduction occurs by non-motile spores.
- (2) Sexual reproduction occurs by motile gametes.
- (3) Sexual reproduction is oogamous.
- (4) Complex post-fertilisation developmental events occur.

22. Identify the parts labelled as A and B in the given figure of Equisetum and select the correct option.



- (1) A–Strobilus; B–Rhizome
- (2) A–Sporophyllis; B–Tuber
- (3) A–Sporangia; B–Rhizome
- (4) A–Sporophyte; B–Tuber

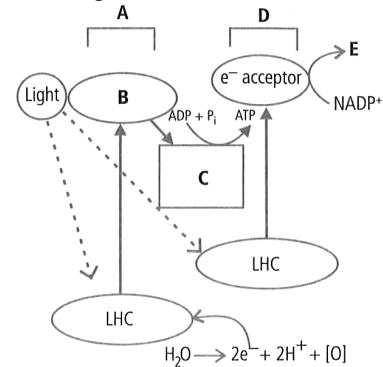
23. On the basis of inputs given, one can put the given organism, in which of the following kingdom? (as per understandings of Linnaeus)

- (A) Cell type-Eukaryotic
- (B) Cell wall-Present (without cellulose)
- (C) Nuclear membrane-Present
- (D) Body organisation-Multicellular/loose tissue
- (E) Mode of nutrition-Heterotrophic (Saprophytic/Parasitic)
- (1) Plantae
- (2) Fungi
- (3) Animalia
- (4) Protista

24. Which of the following tissue systems constitutes bulk of the plant body?

- (1) Epidermal tissue system
- (2) Ground tissue system
- (3) Vascular tissue system
- (4) Both (1) and (3)

25. Identify A, B, C, D and E in the given flow chart showing Z-scheme of light reaction.



- (1) A– P_{700} ; B– H^+ acceptor; C– e^- acceptor; D– P_{680} ; E–NADPH
- (2) A–Photo-system I; B– e^- acceptor; C– e^- transport system; D–Photo-system II; E–NADPH
- (3) A–Photo-system II; B– H^+ acceptor; C– e^- acceptor; D– P_{700} ; E–NADPH
- (4) A–Photo-system II; B– e^- acceptor; C– e^- transport system; D–Photo-system I; E–NADPH

26. Which of the following is an example of differentiation?

- (1) Lignocellulosic wall thickenings of tracheids
- (2) Loss of nucleus, vacuolisation and end wall perforations in sieve tube elements
- (3) Elongation, thickening and emptying of sclerenchyma fibres
- (4) All of these

27. A taxonomic category refers to

- (1) the basic unit of classification
- (2) a rank or level in a taxonomic hierarchy
- (3) a group of related organisms able to interbreed
- (4) a group of related organisms but unable to interbreed freely.

28. _____ bacteria oxidise various inorganic substances such as nitrates, nitrites and ammonia and use the released energy for ATP production. They play an important role in recycling of nutrients (N, P, Fe, S etc.).

- (1) Photosynthetic autotrophic
- (2) Chemosynthetic autotrophic
- (3) Parasitic
- (4) Saprophytic

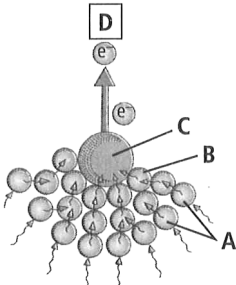
29. ATP assimilation takes place in

- (1) Mitochondrial & chloroplast processes
- (2) Mitochondrial processes only
- (3) All cellular processes
- (4) None of the above

30. In a bisexual flower undergoing self fertilization, all the meiotic divisions result in formation of all functional gametes. The number meiotic divisions to produce 28 seeds is

- (1) 28 (2) 35
(3) 14 (4) 7

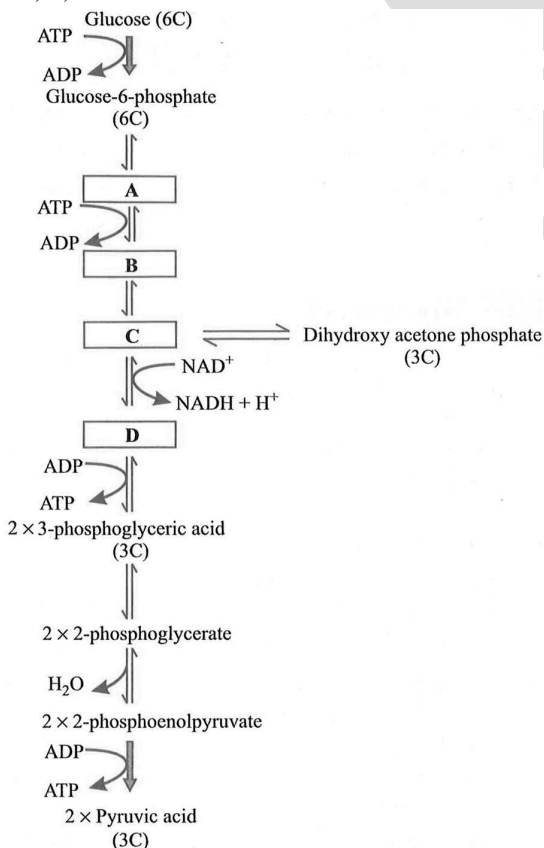
31. Given figure depicts the light harvesting complex (LHC) of photosystem I (PS I).



Select the correct identification for A, B, C and D.

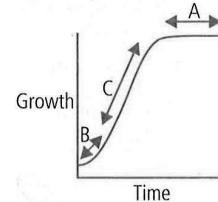
- (1) A–Core molecules; B–Antenna molecule; C–P₆₈₀; D–Primary e⁻ acceptor
(2) A–Antenna molecules; B–Core molecule; C–P₇₀₀; D–Primary e⁻ acceptor
(3) A–Antenna molecules; B–Core molecule; C–P₇₀₀; D–Plastocyanin
(4) A–Core molecules; B–Reaction centre; C–P₆₈₀; D–Plastocyanin

32. The flow chart given below shows the steps in glycolysis. Select the option that correctly fills in the missing steps A, B, C and D.



- (1) A–Fructose-6-phosphate; B–Fructose-1,6-bisphosphate; C–3-PGAL; D–1,3-bisphospho-glyceric acid
(2) A–Fructose-1,6-bisphosphate; B–3-PGAL; C–1,3-bisphospho-glyceric acid; D–3 PGA
(3) A–3-PGA; B–1,3-bisphospho-glyceric acid; C–3-PGAL; D–Fructose-1,6-bisphosphate
(4) A–Fructose-1,6-bisphosphate; B–Fructose-6-phosphate; C–3-PGAL; D–1,3-bisphospho-glyceric acid

33. Given graph is drawn on the parameters of growth versus time. Here A, B and C respectively represent



- (1) exponential phase, log phase and steady state phase
(2) steady state phase, lag phase and log phase
(3) log phase, steady state phase and logarithmic phase
(4) log phase, lag phase and steady state phase.

34. Which of the following statements regarding viruses are correct?

- (i) These are cellular, infectious, nucleoprotein particles.
(ii) They can be grown in culture medium.
(iii) Genetic material is either DNA or RNA, but never both.
(iv) They can be crystallised.

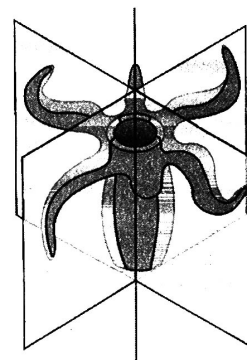
- (1) (i) and (ii) (2) (ii) and (iii)
(3) (iii) and (iv) (4) (i), (ii), (iii) and (iv)

35. What is the number of bivalents in beginning of meiosis I, if the gamete of same organism has 32 chromosomes

- (1) 16 (2) 32
(3) 64 (4) 16 pairs

ZOOLOGY

36. The type of body symmetry shown below can be found in:



- (1) All sponges
(2) Platyhelminthes, aschelminthes and annelids
(3) Coelenterates, ctenophores and adult echinoderms
(4) Arthropods, molluscs, hemichordates and chordates

37. Match the columns :
- | Column-I | Column-III |
|-----------------|-------------------|
| A. Neophron | (i) Vulture |
| B. Struthio | (ii) Penguin |
| C. Pavo | (iii) Peacock |
| D. Aptenodytes | (iv) Ostrich |
- (1) A= (ii), B= (i), C = (iv), D = (iii)
 (2) A= (i), B= (iv), C = (ii), D = (iii)
 (3) A= (i), B= (iii), C = (i), D = (iv)
 (4) A= (i), B= (iv), C = (iii), D = (ii)
38. The first heart sound LUB is associated with thex..... whereas, the second heart sound DUB is associated with they.....
- (1) X = Closure of tricuspid and bicuspid valves;
 Y = Opening of semilunar valves
 (2) X = Opening of tricuspid and bicuspid valves;
 Y = Closure of semilunar valves
 (3) X = Closure of tricuspid and bicuspid valves;
 Y = Closure of semilunar valves
 (4) X = Opening of tricuspid and bicuspid valves;
 Y = Opening of semilunar valves
39. The thyroid gland :
- (1) Is composed of four lobes located on the either side of trachea
 (2) Is composed of two pairs of lobes located on the either side of oesophagus :
 (3) Is composed of follicles and stromal tissues
 (4) Is located in the lower trachea
40. When an apparently healthy person is diagnosed as unhealthy by a psychiatrist, the reason could be that:
- (1) The patient was not efficient at his work
 (2) The patient was not economically prosperous
 (3) The patient shows behavioural and social maladjustment
 (4) He does not take interest in sports
41. Adult human RBCs are enucleate. Which of the following statement (s) is/are most appropriate explanation for this feature?
- (a) They do not need to reproduce
 (b) They are somatic cells
 (c) They do not metabolize
 (d) All their internal space is available for oxygen transport
- (1) Only (d) (2) Only (a)
 (3) (a), (c) and (d) (4) (b) and (c)
42. A. Acetic acid can form cholesterol
 B. Anabolic pathway is endergonic while catabolic pathway is exergonic
 C. All biomolecules have a turn over, i.e., they are constantly being changed into some other biomolecules and also made from other biomolecules.
 D. Flow of metabolites through metabolic pathway has a definite rate and direction. It is called dynamic state of body constituents.
- (1) A and B are correct (2) Only D is correct
- (3) C and D are correct (4) All are correct
43. Which of the following is a correct sequence of step involved in respiration?
- A–Utilization of O₂ by body cells.
 B–Transport of gases by blood upto tissues.
 C–Pulmonary ventilation.
 D–Diffusion of gases at alveolar surface.
 E–Exchange of gases between blood and tissues.
- (1) D – B – E – A – C (2) C – D – B – E – A
 (3) D – E – B – C – A (4) C – E – B – D – A
44. Statement A : Human skull is monocondylic.
 Statement B : Ribs in human are bicephalic.
- (1) Only statement A is correct
 (2) Only statement B is correct
 (3) Both statement A and B are correct
 (4) Both statement A and B are incorrect
45. When egg is not fertilised, yellow coloured corpus luteum degenerates to form
- (1) corpus albicans (2) corpus callosum
 (3) corpora bigemina (4) corpora quadrigemina
46. What should be the features for an ideal contraceptive ?
- (a) It should be user-friendly
 (b) It should be easily available
 (c) It should be ineffective and reversible with least side effects
 (d) It should be effective and reversible with least side effect
 (e) It should be interfere with the sexual act of the user
- (1) (a), (b) and (e) (2) (a), (b) and (c)
 (3) (a), (b) and (d) (4) (a), (b), (d) and (e)
47. Which of the following phyla mentioned below are exclusively marine ?
- (i) Porifera (vi) Annelida
 (ii) Coelenterate (vii) Arthropoda
 (iii) Ctenophora (viii) Mollusca
 (iv) Platyhelminthes (ix) Echinodermata
 (v) Aschelminthes (x) Hemichordata
- (1) (i), (ii), (vi) (2) (iv), (v), (vi)
 (3) (i), (viii), (ix) (4) (iii), (ix), (x)
48. A woman presents to her physician complaining that her menstrual cycles are irregular. She reports that she menstruates each month, but she cannot predict when. After reporting the dates of her last 5 periods, her physician concluded that her cycle is normal, but that it is a 35 days cycle. She reports that she wants to get pregnant, but cannot predict when ovulation will occur. Her physician will tell her that she should expect to ovulate on day
- (1) 10 (2) 17
 (3) 15 (4) 21

49. The catalytic cycle of an enzyme action can be described by the steps given below.
- A. The active site of the enzyme, now in close proximity of the substrate, breaks the chemical bonds of the substrate and the new enzyme-product complex is formed.
- B. The binding of the substrate induces the enzymes to alter its shape, fitting more tightly around the substrate.
- C. The substrate binds to the active site of the enzyme, fitting into the active site.
- D. The enzyme releases the products of the reaction and the free enzyme is ready to bind to another molecule of the substrate and run through the catalytic cycle once again.
- Arrange them in the correct sequence.
- (1) C → B → A → D (2) B → C → D → A
 (3) C → B → D → A (4) D → B → A → C

50. Identify A, B, C and D in the given table :

Mineralocorticoid	Glucocorticoid
Secreted by zona glomerulosa	A
B	Its secretion is under the control of ACTH
C	D

Options	A	B	C	D
(1)	Secreted by zona reticularis	Its secretion is under the control of renin-angiotensin system	It stimulates K ⁺ excretion	It stimulates gluconeogenesis
(2)	Secreted by zona fasciculata	It is under the control of ACTH	It stimulates Na ⁺ excretion and K ⁺ reabsorption	It stimulates gluconeogenesis
(3)	Secreted by zona fasciculata	Its secretion is under the control of renin-angiotensin system	It stimulates K ⁺ excretion and Na ⁺ reabsorption	It stimulates gluconeogenesis
(4)	Secreted by zona glomerulosa	It is under the control of ACTH	It stimulates K ⁺ and Na ⁺ excretion	It stimulates gluconeogenesis