VMC MEDICAL

Lifeline of NEET Aspirants

Sample Paper	12 Studying (Medical)

Duration: 2 Hrs **Maximum Marks: 260**

PAPER SCHEME :

- The paper contains **65** Objective Type Questions divided into three sections: **Section - I (Physics), Section - II (Chemistry) and Section - III (Biology)**.
- **Section - I** contain **15 Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE CHOICE is correct**.
- **Section - II** contains **15 Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE CHOICE is correct**.
- **Section - III** contains **35 Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE CHOICE is correct**.

MARKING SCHEME:

- For each question in Section-I, II and III, **4 marks** will be awarded for correct answer and **–1 negative marking** for incorrect answer.

SECTION – I [PHYSICS]

1. A battery is used to charge a parallel plate capacitor till the potential difference between the plates becomes equal to the electromotive force of the battery. The ratio of the energy stored in the capacitor to the work done by the battery will be:

(A) 1 **(B)** 2 **(C)** $\frac{1}{4}$ **(D)** $\frac{1}{2}$

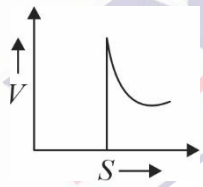
2. Three charges $+Q, q, +Q$ are placed respectively at distance $0, \frac{d}{2}$ and d from the origin on the X-axis. If the net force experienced by $+Q$ placed at $x = 0$ is zero, then value of q is:

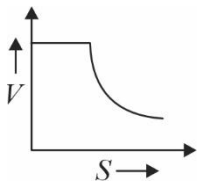
(A) $\frac{+Q}{2}$ **(B)** $\frac{+Q}{4}$ **(C)** $\frac{-Q}{2}$ **(D)** $\frac{-Q}{4}$

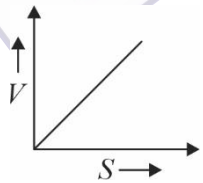
3. A dipole is placed parallel to the electric field. If W is the work done in rotating the dipole by 60°, then work done in rotating it by 180° is:

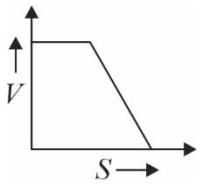
(A) $2W$ **(B)** $3W$ **(C)** $4W$ **(D)** $\frac{W}{2}$

4. In the case of a charged metallic sphere, potential (V) changed with respect to distance (s) from the centre as:

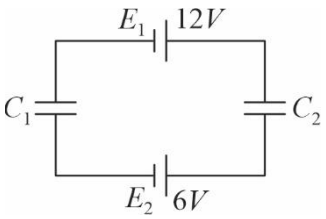
(A) 

(B) 

(C) 

(D) 

5. In the circuit shown in the figure,



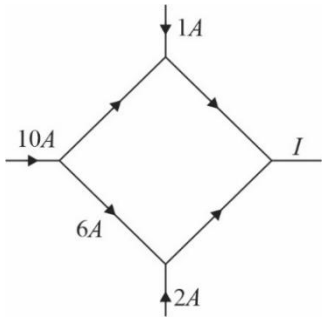
(A) the charge on C_2 is greater than on C_1

(B) the charge on C_1 and C_2 are same

(C) p.d across C_1 and C_2 and same

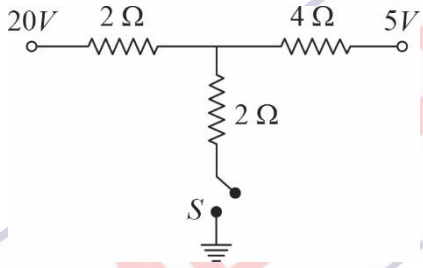
(D) p.d across C_1 is greater than that across C_2

6. The figure shows a network of currents. The magnitude of current is shown here. The current I will be:



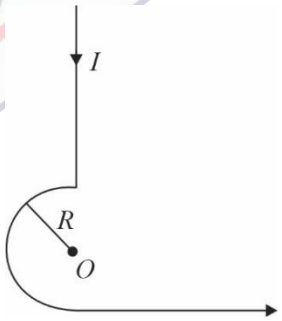
(A) $3A$ **(B)** $9A$ **(C)** $13A$ **(D)** $19A$

7. If the switch S is closed in the circuit as shown in the figure, then current passed through it is:



(A) $4.5A$ **(B)** $6.0A$ **(C)** $3.0A$ **(D)** zero

8. Magnetic field induction at the point O due to current flowing in an infinite wire shaped as shown in the figure is:



(A) $\frac{\mu_0 I}{4\pi R}$ **(B)** $\frac{\mu_0 I}{4R}-\frac{\mu_0 I}{4\pi R}$ **(C)** $\frac{\mu_0 I}{4R}-\frac{\mu_0 I}{2\pi R}$ **(D)** $\frac{\mu_0 I}{4R}+\frac{\mu_0 I}{4\pi R}$

9. The magnetic susceptibility of any paramagnetic material changes with absolute temperature T as:

(A) Directly proportional to T **(B)** Remains constant

(C) Inversely proportional to T **(D)** Exponentially decaying with T

10. An electron accelerated through a potential difference V passes through a uniform transverse magnetic field and experiences a force F. If the accelerating potential is increased to $2V$, the electron in the same magnetic field will experience a force:

(A) F **(B)** $\frac{F}{2}$ **(C)** $\sqrt{2}F$ **(D)** $2F$

11. A charge q moves in a region where electric field and magnetic field both exist, then force on it is:

(A) $q\left(\vec{v}\times\vec{B}\right)$ **(B)** $q\vec{E}+q\left(\vec{v}\times\vec{B}\right)$

(C) $q\vec{E}+q\left(\vec{B}\times\vec{v}\right)$ **(D)** $q\vec{B}+q\left(\vec{E}\times\vec{v}\right)$

12. A galvanometer has a coil of resistance 100 ohm and gives a full-scale deflection for 30 mA current. If it is worked as a voltmeter of 30 volt range, the resistance required to be added will be:

(A) 900Ω **(B)** 1800Ω **(C)** 500Ω **(D)** 1000Ω

13. A solenoid has 200 turns wound over a length of 0.3 *m*. The area of its cross-section is $1.2\times10^{-3}m^2$. Around its central section a coil of 300 turns is wound. If an initial current of 2*A* is reversed in 0.25 sec., the emf induced in the coil is equal to:

(A) $6\times10^{-4}V$ **(B)** $4.8\times10^{-2}V$ **(C)** $6\times10^{-2}V$ **(D)** $48kV$

14. If *L* and *R* denote inductance and resistance, then dimension of $\frac{L}{R}$ is:

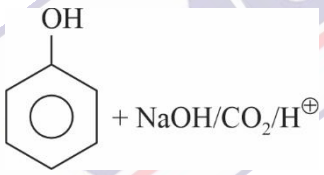
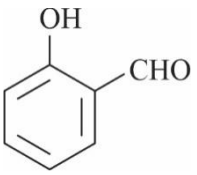
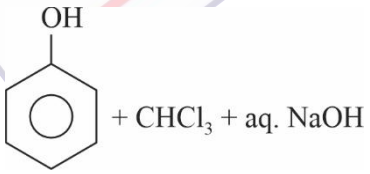
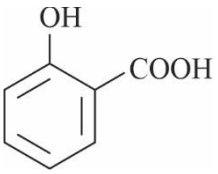
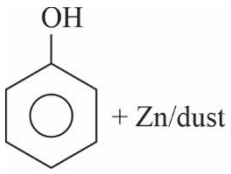
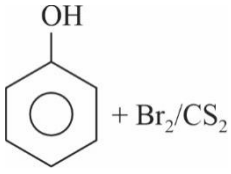
(A) $\left[M^0L^0T^0\right]$ **(B)** $\left[M^0L^0T\right]$ **(C)** $\left[M^2L^0T\right]$ **(D)** $\left[MLT^2\right]$

15. A coil of $N = 100$ turns caries a current $I = 5\ A$ and creates a magnetic flux $\phi = 10^{-5}Tm^2$ per turn. The value of its inductance *I* will be:

(A) 0.05 *mH* **(B)** 0.10 *mH* **(C)** 0.15 *mH* **(D)** 0.20 *mH*

SECTION – II [CHEMISTRY]

16. Match List-I with List-II.

List-I		List-II	
(a)		**(i)**	
(b)		**(ii)**	
(c)		**(iii)**	
(d)		**(iv)**	

Choose the correct answer from the options given below:

(A) a-ii, b-i, c-iv, d-iii **(B)** a-i, b-ii, c-iii, d-iv

(C) a-iii, b-iv, c-i, d-ii **(D)** a-iv, b-iii, c-ii, d-i

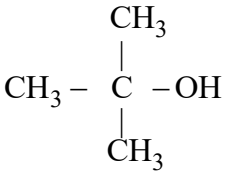
17. In the given reaction, $C_6H_5-O-CH_2-CH_3 \xrightarrow{\text{excess HI}/\Delta} [P]+[Q]$

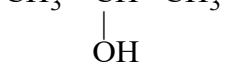
[P] and [Q] will, respectively, be:

(A) C_6H_2I and CH_3-CH_2-I **(B)** C_6H_5OH and CH_3-CH_2-I

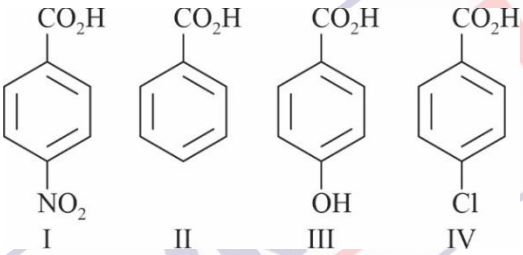
(C) C_6H_5I and CH_3-CH_2-I **(D)** C_6H_5OH and $H_2C=CH_2$

18. Which of the following alcohol will give turbidity immediately:

(A)  **(B)** CH_3CH_2OH

(C)  **(D)** 

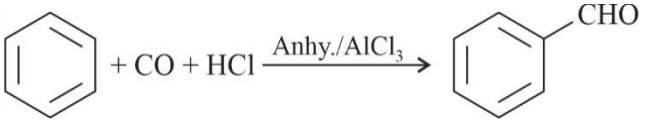
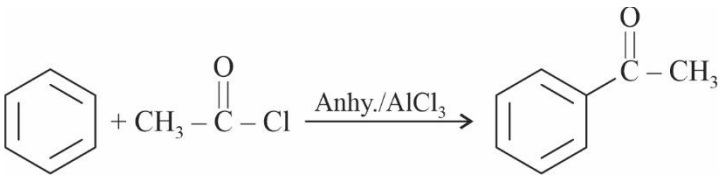
19. The increasing order of the acidity of the following carboxylic acids is:



(A) III < II < < IV < I **(B)** I < III < II < IV

(C) IV < II < III < I **(D)** II < IV < III < I

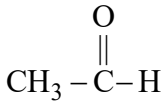
20. Match the column:

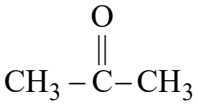
List-I		List-II	
(I)	$CH_3-CN \xrightarrow[(ii)\,H_2O/H^+]{(i)\,SnCl_2/HCl} CH_3-CHO$	**(P)**	Friedel craft reaction
(II)	$CH_3-COCl+H_2 \xrightarrow{Pd/BaSO_4} CH_3-CHO$	**(Q)**	Gattermann Koch reaction
(III)		**(R)**	Rosenmund reaction
(IV)		**(S)**	Stephen reduction

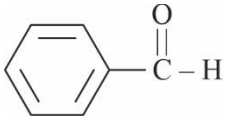
(A) I-S; II-R; III-Q; IV-P **(B)** I-P; II-Q; III-R; IV-S

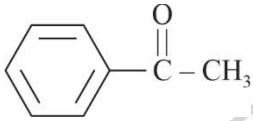
(C) I-S; II-P; III-Q; IV-R **(D)** I-S; II-R; III-P; IV-Q

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

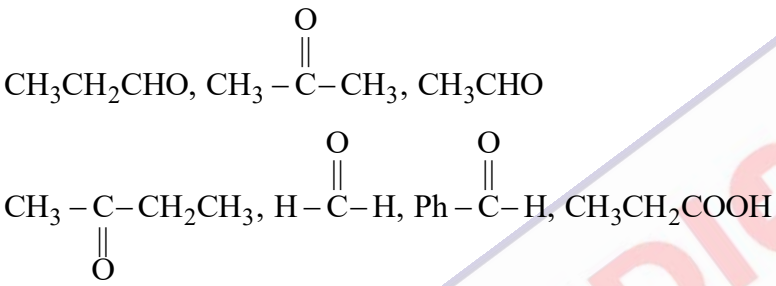
(A) 

(B) 

(C) 

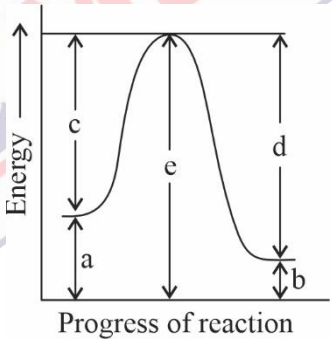
(D) 

22. How many of the following compounds give aldol reaction?



(A) 3 **(B)** 5 **(C)** 6 **(D)** 4

23. For the chemical process energies are plotted in graph:



Which of the following is/are correct?

(I) It is the exothermic reaction, $\Delta H = d - a$

(II) Threshold energy, $e = a + c$

(III) $(E_a)_f < (E_a)_b$

(A) I and III only **(B)** I and II only **(C)** I, II and III **(D)** II and III only

24. The half-life of a first order reaction is 2000 years. If the concentration of reactant after 8000 years is 0.02 M, then the initial concentration of reactant was $(A \rightarrow B)$:

(A) 0.04 M **(B)** 0.16 M **(C)** 0.32 M **(D)** 0.08 M

25. Given below are two statements:

Statement I: Copper sulphate can be stored in zinc vessel.

Statement II: The position of zinc is higher than copper in the electrochemical series with respect to oxidation potentials.

(A) Both statement I and Statement II are correct

(B) Statement I is correct but Statement II is incorrect

(C) Statement I is incorrect but Statement II is correct

(D) Both Statement I and Statement II are incorrect

26. E° for the reaction: $Fe(s)+2M^{+}(aq)\longrightarrow Fe^{2+}(aq)+2M(s)$ is 0.93V. What is the standard potential $M^{+}+e^{-}\longrightarrow M$, if $E^{\circ}_{Fe^{2+}/Fe}=-0.44V$?

(A) 0.26 V **(B)** 0.49 V **(C)** 0.67 V **(D)** 1.34 V

27. The molar conductivity of NaCl, HCl and CH_3COONa at infinite dilution are 126.45, 426.16 and $91\Omega^{-1}cm^{-2}mol^{-1}$ respectively. The molar conductivity of CH_3COOH at infinite dilution is:

(A) $201.28\,S\,cm^2mol^{-1}$

(B) $698.28\,S\,cm^2mol^{-1}$

(C) $390.71\,S\,cm^2mol^{-1}$

(D) $540.45\,S\,cm^2\,mol^{-1}$

28. If vapour pressure of pure liquid A is 100 mm Hg and vapour pressure of pure liquid B is 150 mm Hg. 2 moles of liquid A and 3 moles of liquid B are mixed to form an ideal solution. The vapour pressure of the solution (in mm Hg) will be:

(A) 135 **(B)** 130 **(C)** 140 **(D)** 145

29. Compounds 'A' and 'B' react according to the following chemical equation.

$A(g)+2B(g)\rightarrow 2C(g)$

Concentration of either 'A' or 'B' were changed keeping the concentration of one of the reactants constant and rates were measured as a function of initial concentration. Following results were obtained.

Choose the correct option for the rate equations for this reaction.

Experiment	Initial concentration of $[A]/mol\,L^{-1}$	Initial concentration of $[B]/mol\,L^{-1}$	Initial rate of formation of $[C]/mol\,L^{-1}s^{-1}$
1.	0.30	0.30	0.10
2.	0.30	0.60	0.40
3.	0.60	0.30	0.20

(A) $Rae=k[A]^2[B]$ **(B)** $Rate=k[A][B]^2$

(C) $Rate=k[A][B]$ **(D)** $Rate=k[A]^2[B]^0$

30. The mole fraction of a solute in a 100 molal aqueous solutions is _____ $\times 10^{-2}$.

(A) 6.4 **(B)** 64 **(C)** 640 **(D)** 0.64

SECTION – III [BIOLOGY]

31. Given below are two Statements:

STATEMENT I: Cleistogamous flowers are invariably autogamous

Statement II: Cleistogamous is disadvantageous as there is no chance for cross pollination.

(A) Both Statement I and Statement II are correct.

(B) Both Statement I and Statement II are INCORRECT

(C) Statement I is Correct but Statement II is incorrect

(D) Statement I is incorrect but Statement II is correct

32. **Assertion:** Cultivation of hybrids has tremendously increased the productivity.

Reason: If hybrids are made into apomicts, there is segregation of character in progeny

(A) If both assertion and reason are true and reason is correct explanation of assertion

(B) If both assertion and reason are true but reason is not correct explanation of assertion

(C) If assertion is true, but reason is false

(D) If both assertion and reason are false Statements

33. Total no. of nuclei involved in Double Fertilization is:

(A) Two **(B)** Six **(C)** Five **(D)** Three

34. Read the following Statements.

(I) Yucca plant and moth pronuba cannot complete their life cycle without each other.

(II) Insect robbers consume pollen or nectar without bringing about pollination.

(III) Majority of flowering plants produce hermaphrodite flowers.

(IV) Continued cross pollination results in inbreeding depression.

Which of following Statements are Correct?

(A) (I), (II), (III) only **(B)** (I) and (III) only

(C) (I) and (IV) only **(D)** All of these

35. Observe the examples given in box and find out how many of them possess single ovule in each ovary?

(PAPAYA, WATER MELON, WHEAT, PADDY, ORCHIDS AND MANGO)

(A) Three **(B)** Four **(C)** Five **(D)** Six

36. Read the following Statement and select the correct one(s):

(I) Mendelian disorders are mainly determined by alteration or mutation in single gene

(II) Chromosomal disorders are caused due to absence or excess or abnormal arrangement of one or more chromosomes.

(III) Aneuploidy arise due to chromosomal non-disjunction.

(IV) Sickle cell anemia is X-linked disorder.

(A) Two **(B)** Three **(C)** four **(D)** five

37. Read the following statements:

(I) 44 + XXY results in Klinefelter syndrome.

(II) Individuals with Klinefelter's syndrome has overall masculine development are sterile and also show gynaecomastia.

(III) 44 + XO results in Turner's syndrome

(IV) Few Individuals with Turner's syndrome possess most of secondary sexual characters

(V) Individuals with Turner's syndrome are sterile with rudimentary ovaries.

Which of the above Statements are correct?

(A) (I), (II), (III), and (V) **(B)** (II) only

(C) (IV) and (V) **(D)** (III), (IV) and (V)

38. What is true for an individual suffering from Down's syndrome?

(A) Short statured, small round head

(B) Furrowed tongue, palm crease

(C) Physical, psychomotor and mental development is retarded.

(D) All of the above.

39. A Couple heterozygous for Sickle cell anemia expects a baby, what are the chances of their having completely normal baby?

(A) 25% **(B)** 75% **(C)** 50% **(D)** 65%

40. The Phenomenon of pleiotropism refer to:

(A) A single gene affecting multiple phenotypic expression

(B) More than two genes affecting a single character

(C) Presence of several alleles of a single gene controlling a single cross-over

(D) Presence of two alleles, each of two genes controlling a single trait

41. Which of the following is constitutive gene in Lac-operon?

(A) i-gene **(B)** z-gene **(C)** y-gene **(D)** a-gene

42. **Assertion:** The i gene in Lac-operon codes for inducer protein.

Reason: The i gene produces a repressor protein that binds to operator region and prevent transcription.

(A) Both assertion and reason are correct and reason is correct explanation of assertion

(B) Both assertion and reason are correct and reason is not correct explanation of assertion

(C) Assertion is true, reason is false

(D) Assertion is false, reason is true

43. Which of the following is incorrect?

(A) In prokaryotes, commonly, the translation begins much before the mRNA is fully transcribed

(B) In prokaryotes, transcription and translation [of same mRNA] occurs simultaneously

(C) In prokaryotes transcription and translation occur in the cytosol

(D) In Eukaryotes, transcription and translation [of same mRNA] can occur simultaneously.

44. Arrange the following Steps of DNA fingerprinting in sequence:

I. Hybridisation using labelled VNTR Probe.

II. Isolation of DNA.

III. Detection of hybridised DNA fragments by autoradiography.

IV. Southern blotting.

V. DNA fragment separation by gel-electrophoresis.

VI. Digestion of DNA by restriction endonucleases.

VII. Alkali treatment to denature DNA.

(A) II - I - III - IV - V - VI – VII **(B)** II - VI - V - IV - VII - I – III

(C) II - VI - V - VII - I - IV – III **(D)** II - V - VI - VII - I - IV - III

45. Identify the microorganism which is responsible for production of an immunosuppressive molecule Cyclosporin A?

(A) Trichoderma polysporum **(B)** Clostridium butylicum

(C) Aspergillus niger **(D)** Streptococcus cerevisiae

46. Match the following List of Bioactive substances and their roles:

Bioactive Substance		**Role**	
(I)	Statin	**(P)**	Removal of oil stains
(II)	Cyclosporin A	**(Q)**	Removal of clots from blood vessels
(III)	Streptokinase	**(R)**	Lowering of blood cholesterol
(IV)	Lipase	**(S)**	Immuno-suppressive agent

Choose the correct match

(A) I = (Q), II = (R), III = (P), IV = (S) **(B)** I = (S), II = (Q), III = (P), IV = (R)

(C) I = (S), II = (P), III = (Q), IV = (R) **(D)** I = (R), II = (S), III = (Q), IV = (P)

47. In sewage treatment plant, the primary sludge is obtained by a:

(A) Physical chemical process **(B)** Physical process

(C) Biological process **(D)** Physical biological process

48. The endometrium of uterus:

(A) Undergoes cyclical changes during menstrual cycle

(B) Has a functional layer that thickens and then is sloughed during menstrual cycle

(C) Exhibits strong contraction during delivery of the baby

(D) More than one option is correct

49. An ideal contraceptive should:

(A) Interfere with the sexual act of the user

(B) Interfere with the sexual drive of the user

(C) Always be used orally

(D) Be easily available, user-friendly, effective and reversible with no side effects

50. Which of the following is correct?

(A) Life originated in water

(B) RNA evolved earlier than DNA

(C) The first life forms on the earth were chemoheterotrophs

(D) More than one option is correct

51. Pneumonia is caused by:

(A) *Haemophilus influenzae* **(B)** *Plasmodium*

(C) *Bacillus* **(D)** All of these

52. Infectious stage of *Plasmodium* that enters the human body is:

(A) Trophozoites **(B)** Sporozoites

(C) Female gametocytes **(D)** Male gametocytes

53. Analogous structures:

(A) Are the results of divergent evolution

(B) Are anatomically different having similar function

(C) Can be exemplified by the eye of octopus and eyes of mammals or the flippers of penguins and dolphins

(D) Is related to all of the above

54. Match List-I with List-II.

List-I		**List-II**	
I.	Vaults	(P)	Entry of sperm through cervix is blocked
II.	IUDs	(Q)	Removal of vas deferens
III.	Vasectomy	(R)	Phagocytosis of sperms within the uterus
IV.	Tubectomy	(S)	Removal of fallopian tube

Choose the correct answer from the options given below:

(A) I = (R), II = (P), III = (S), IV = (Q) **(B)** I = (S), II = (Q), III = (P), IV = (R)

(C) I = (P), II = (R), III = (Q), IV = (S) **(D)** I = (Q), II = (S), III = (R), IV = (P)

VMC MEDICAL

55. An individual who has undergone vasectomy:

(A) Can not form sperms

(B) Can not ejaculate

(C) Has lower levels of male sex hormones in his blood

(D) Can ejaculate semen

56. The egg after coming out of ovary enters the fallopian tube in:

(A) Mature stage **(B)** Oogonial cell stage

(C) Secondary oocyte stage **(D)** Primary oocyte stage

57. Medical termination of pregnancy is:

(A) Essential in certain cases where continuation of the pregnancy could be harmful or even fatal either to the mother or to the foetus or both.

(B) Unsafe during the first trimester, i.e., upto 12 weeks of pregnancy

(C) Quite safe even if performed by quacks as it involves no expertise

(D) In India is illegally practiced to discard the male foetus

58. Which one of the following sequences was proposed by Darwin and Wallace for organic evolution?

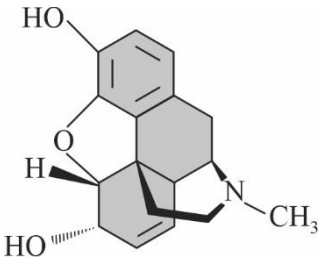
(A) Overproduction, variations, constancy of population size, natural selection

(B) Variations, constancy of population size, overproduction, natural selection

(C) Overproduction, constancy of population size, variations, natural selection

(D) Variations, natural selection, overproduction, constancy of population size

59. Choose the correct option for the chemical structure shown:



(A) It is a sedative and painkiller **(B)** It is obtained from *Atropa belladonna*

(C) It is obtained from *Cannabis sativa* **(D)** It has hallucinogenic properties

60. Given below are two statements:

Statement I: Bone marrow is the main lymphoid organ where all blood cells including lymphocytes are produced.

Statement II: Both bone marrow and thymus, provide micro environments for the development and maturation of T-Lymphocytes.

In the light of the above statements, choose the most appropriate answer from the options given below:

(A) Both Statement-I and Statement-II are correct

(B) Both Statement-I and Statement-II are incorrect

(C) Statement-I is correct but Statement-II is incorrect

(D) Statement-I is incorrect but Statement-II is correct

61. **A:** In England before industrialisation, white winged moths outnumbered the dark-winged moths and vice-versa was true after industrialisation (1920s).

R: During post industrialisation period, the tree trunk became dark so, white winged moths were easily identified by the predators.

(A) (A) and (R) are true, and (R) is the correct explanation of (A)

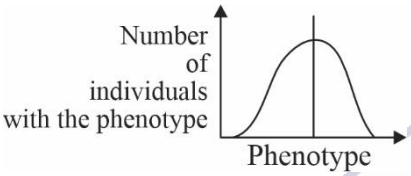
(B) (A) and (R) are true, but (R) is not the correct explanation of (A)

(C) (A) is true, but (R) is false

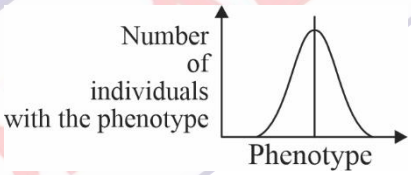
(D) (A) is false, but (R) is true

62. The diagrammatic representation of operation of natural selection is shown. Which of the following option indicates 'directional selection'?

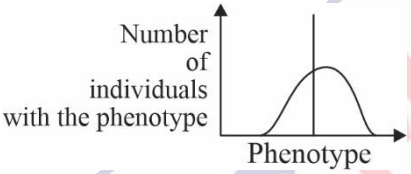
(A)



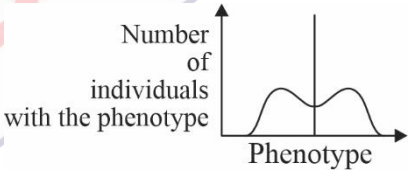
(B)



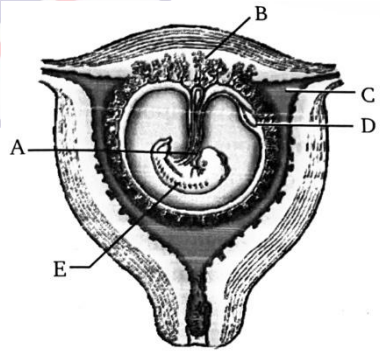
(C)



(D)



63. Identify A, B, C, D and E in the diagram showing human foetus within the uterus:



(A) A – Umbilical cord, B – Placental villi, C – Yolk sac, D - Uterus cavity, E - Embryo

(B) A – Placental villi, B – Umbilical cord, C – Uterus cavity, D – Yolk sac, E - Embryo

(C) A – Umbilical cord, B – Placental villi, C – Uterus cavity, D – Yolk sac, E - Embryo

(D) A – Umbilical cord, B – Placental villi, C – Uterus cavity, D – Yolk sac, E - Zygote

64. Which of the following statements are correct regarding female reproductive cycle?

(a) In non-primate mammals cyclical changes during reproduction are called oestrus cycle

(b) First menstrual cycle begins at puberty and is called menopause

(c) Lack of menstruation may be indicative of pregnancy

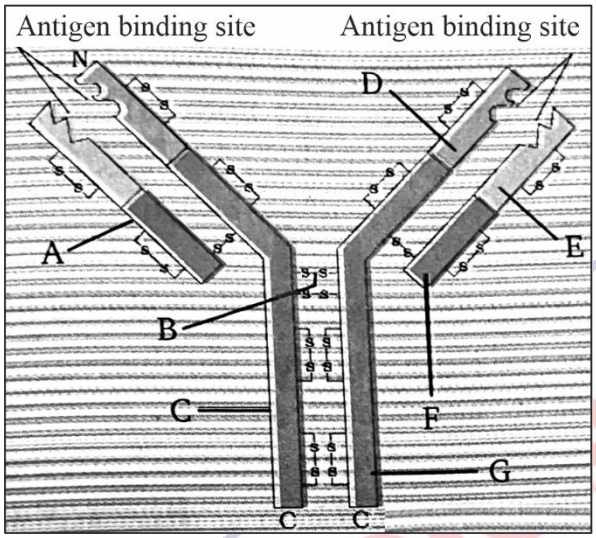
(d) Cyclic menstruation extends between menarche and menopause

Choose the most appropriate answer from the options given below

(A) a, b and c only **(B)** a, c and d only

(C) a and d only **(D)** a and b only

65. Identify A, B, C, D, E, F and G as labelled in the diagram:



	A	B	C	D	E	F	G
(A)	Light chain	Disulphide bond	Light chain	Variable region of heavy chain	Variable region of light chain	Constant region of light chain	Constant region of heavy chain
(B)	Light chain	Disulphide bond	Light chain	Constant region of heavy chain	Constant region of light chain	Variable region of light chain	Variable region of light chain
(C)	Light chain	Disulphide bond	Light chain	Constant region of heavy chain	Variable region of light chain	Constant region of light chain	Variable region of heavy chain
(D)	Light chain	Disulphide bond	Heavy chain	Variable region of heavy chain	Variable region of light chain	Constant region of light chain	Constant region of heavy chain

End of Sample Paper 12 Studying Medical