RANKERS
JEE | NEET | FOUNDATION

RGP – RANKERS GUARANTEED PROGRAM

Set

1

(Physics, Chemistry and Biology)

Time : 1 Hour   Studying in class 12th (NEET) & Moving to Target (NEET)   Marks : 120

1. General Instructions: **(Paper Code: 1302)**

* ∗ *This test paper consists of 60 question in 3 section (A, B, C)*
  Marking Scheme:
  * ➢ *Full marks: + 2 if answered correctly.*
  * ➢ *Zero marks: 0 if not attempted or incorrect.*

2. RGP College Grant Criteria:
  * ✓ **Students must score a minimum of 70% positive marks in RGP.**
  * ✓ **Student must get under AIR 5,000 in JEE/NEET Examination.**

3. Cash Reward Criteria:
  * ✓ **Students must score a minimum of 70% positive marks in their respective papers.**
  * ✓ **Exciting Cash Rewards for RGP Toppers**
    * • **1st Topper – ₹ 21,000/-**
    * • **2nd Topper – ₹ 11,000/-**
    * • **3rd – 5th Topper – ₹ 5,100/-**
    * • **6th – 10th Topper – ₹ 2,100/-**
      Students Scoring Rank from 11th – 20th will get Exciting Rewards.

4. Scholarship Criteria in Rankers Offline Classroom Program:

  (100% FEE WAIVER – 1ST TOPPER) **and must getting above 70% marks.**

  * ✓ **80% Fee Waiver – Student Scoring 80% and above.**
  * ✓ **60% Fee Waiver – Student Scoring 70% to 79.999%.**
  * ✓ **50% Fee Waiver – Student Scoring 60% to 69.999%.**
  * ✓ **40% Fee Waiver – Student Scoring 50% to 59.999%.**
  * ✓ **20% Fee Waiver – Student Scoring 30 % to 49.999%**
  * ✓ **10% Fee Waiver – All the Aspirants Appearing in RGP.**

Student's Name: - ....

School Name: - ....

Class: - .... **Mob. No.** ....

Student's Signature: - ……………………………….   **Invigilator's Signature: -** ………………………………

## Physics (Section – A)

1. An alternating voltage $v(t) = 220 \sin 100\pi t$ volt is applied to a purely resistive load of 50 Ω. The time taken for the current to rise form half of the peak value to the peak value is:
   (A) 5 ms   (B) 2.2 ms   (C) 7.2 ms   (D) 3.3 ms

2. A square coil ABCD with its plane vertical is released from rest in a horizontal uniform magnetic field $\vec{B}$ of length 2L. The acceleration of the coil is:
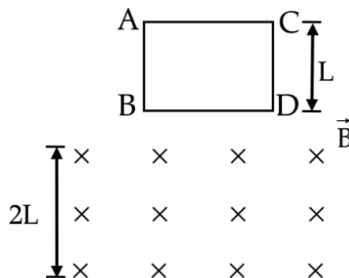
   (A) less than g for all the time till the loop crosses the magnetic field completely
   (B) less than g when it enters the field and greater than g when it comes out of the field
   (C) g all the time
   (D) less than g when it enters and comes out of the field but equal to g when it is within the field

3. Figure represents a square carrying charges +q, +q, -q, -q at its four corners as shown. Then the potential will be zero at points
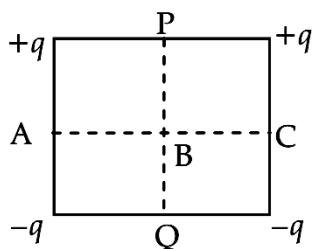

   (A) A, B, C, P and Q   (B) A, B and C   (C) A, P, C and Q   (D) P, B and Q

4. If the frequency of light in a photoelectric experiment is doubled, the stopping potential will:
   (A) be doubled   (B) be halved
   (C) become more than double   (D) become less than double

5. The value of series limit in the case of paschen series is:
   (A) 1875 nm   (B) 122 nm   (C) 822 nm   (D) tending to zero

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6. In the interference of two sources of intensities I_0 and $9I_0$ the intensity at a point where the phase difference is $\frac{\pi}{2}$ is:

   (A) $10\,I_0$ (B) $8\,I_0$ (C) $\sqrt{82\,I_0}$ (D) $4\,I_0$

7. Power dissipated by the circuit is ……... W.
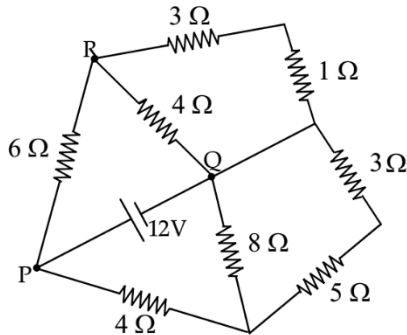
   (A) 34   (B) 36   (C) 35   (D) 37
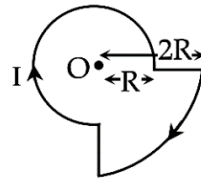
8. In Young's experiment, the ratio of maximum and minimum intensities in the fringe system is 9:1. The ratio of amplitudes of coherent sources is:
   (A) 9 : 1   (B) 3 : 1   (C) 2 : 1   (D) 1 : 1

9. A prism has a refractive index of cot A/2. Then minimum angle of deviation is:
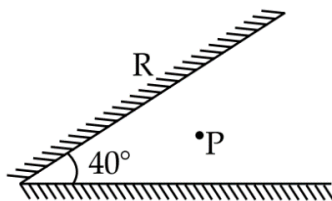   (A) $180° - A$ (B) $180° - 2A$ (C) $90° - A$ (D) A/2

10. A current I flowing through the loop as shown in the adjoining figure. The magnetic field at centre O is:
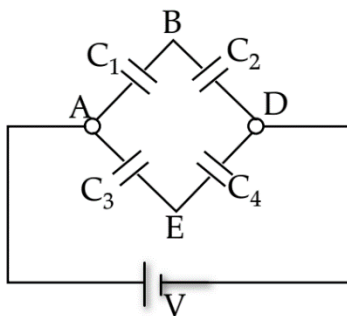

    (A) $\frac{7\mu_0 I}{16\,R}\otimes$ (B) $\frac{7\mu_0 I}{16\,R}\odot$ (C) $\frac{5\mu_0 I}{16\,R}\otimes$ (D) $\frac{5\mu_0 I}{16\,R}\odot$

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11. Two plane mirrors are inclined at an angle of 40°. The possible number of images of an object placed at point P would be?

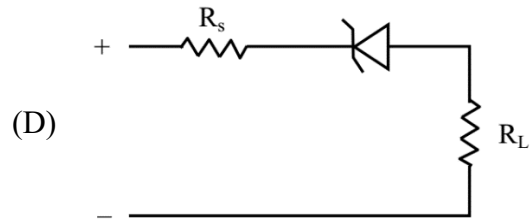(A) 4   (B) 6   (C) 7   (D) 8

12. Potential difference between the points B and E of the circuits is:

(A) $\left\{\dfrac{C_1 C_4 + C_3 C_2}{C_1 + C_2 + C_3 + C_4}\right\} V$

(B) $\left\{\dfrac{C_1 C_4 - C_3 C_2}{C_1 + C_2 + C_3 + C_4}\right\} V$

(C) $\left\{\dfrac{C_1 C_4 + C_3 C_2}{(C_1 + C_2)(C_3 + C_4)}\right\} V$

(D) $\left\{\dfrac{C_1 C_4 - C_3 C_2}{(C_1 + C_2)(C_3 + C_4)}\right\} V$

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13. A zener diode is to be used as a voltage regulator. Identify the correct set up:

(A)

R_s

R_L

(B)

R_s

R_L

(C)

R_s

R_L

(D)

R_s

R_L
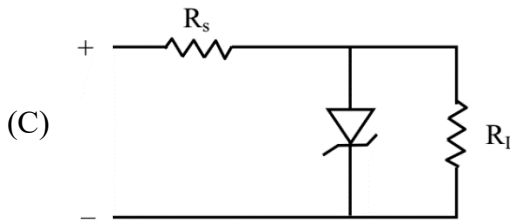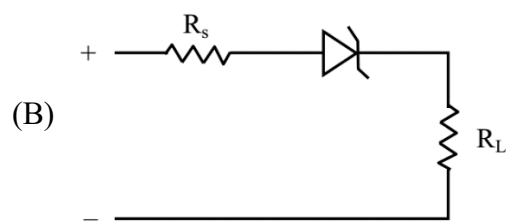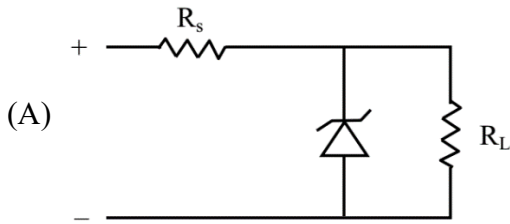
14. A ray of light from a denser medium strikes a rarer medium at an angle of incidence i as shown in figure. Refracted and reflected rays make an angle of 90° with each other. Angle of reflection and refraction are r and r'. Then critical angle is:
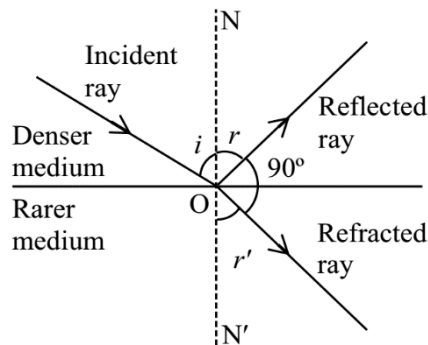
N
Incident
ray
Reflected
Denser
ray
medium
i r
90°
Rarer
O
medium
Refracted
r' ray
N′

(A) $\sin^{-1}(\sin i)$ (B) $\sin^{-1}(\sin r)$ (C) $\sin^{-1}(\tan i)$ (D) $\sin^{-1}(\tan r)$

15. A point object is placed at a distance of 30 cm from a convex mirror of focal length 30 cm. What is the separation between the image and the object?
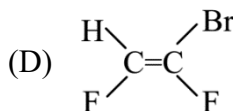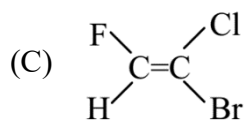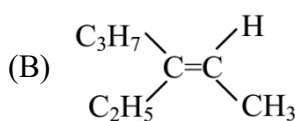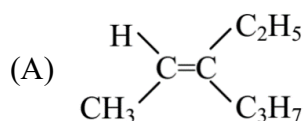   (A) 40 cm   (B) 45 cm   (C) 50 cm   (D) 55 cm

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Chemistry (Section – B)

16. When 1-alkyne is treated with Na + Liq. NH_3 and product is reacted with methyl chloride, the end product of the reaction will be:
    (A) Lower alkyne having two carbon less than 1-alkyne
    (B) Lower alkyne having one carbon less than 1-alkyne
    (C) Higher alkyne having one carbon more than 1-alkyne
    (D) Higher alkyne having two carbon more than 1-alkyne

17. The power of halides of boron to act as lewis acids decreases in the order:
    (A) $BF_3 > BCl_3 > BBr_3$ (B) $BBr_3 > BCl_3 > BF_3$
    (C) $BCl_3 > BF_3 > BBr_3$ (D) $BCl_3 > BBr_3 > BF_3$

18. The Z-configuration in the following is:

(A)
$$\begin{array}{c} H \\ \diagdown \\ CH_3 \end{array} C=C \begin{array}{c} C_2H_5 \\ \diagup \\ \diagdown \\ C_3H_7 \end{array}$$

(B)
$$\begin{array}{c} C_3H_7 \\ \diagdown \\ C_2H_5 \end{array} C=C \begin{array}{c} H \\ \diagup \\ \diagdown \\ CH_3 \end{array}$$

(C)
$$\begin{array}{c} F \\ \diagdown \\ H \end{array} C=C \begin{array}{c} Cl \\ \diagup \\ \diagdown \\ Br \end{array}$$

(D)
$$\begin{array}{c} H \\ \diagdown \\ F \end{array} C=C \begin{array}{c} Br \\ \diagup \\ \diagdown \\ F \end{array}$$

19. Two substances A ($t_{1/2}$ = 5 min) and B ($t_{1/2}$ = 15 min) are taken in such a way that initially [A] = 4[B]. The time after which both the concentration will be equal is …… (assuming reactions are of first order).
    (A) 15   (B) 16   (C) 17   (D) 18

20. Methanol and ethanol are distinguished by:
    (A) Treating with victor mayer test
    (B) Treating with Lucas reagent
    (C) Heating with iodine and alkali
    (D) Treating with CrO_3 in dil. H_2SO_4

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21. Lanthanide contraction is related with:
    (A) Sharp decrease in atomic size in lanthanide series
    (B) Slow or gradual decrease in atomic size in lanthanide series
    (C) Constancy in atomic size
    (D) All of the above

22. The reduction of oct-4-yne with H_2 in the presence of $Pd/CaCO_3$ – quinolone gives (as a major product) – (Hydrocarbon)
    (A) trans-oct-4-ene   (B) cis-oct-4-ene
    (C) a mixture of cis and trans-oct-4-ene   (D) a completely reduced product C_8H_{18}

23. Ester A $(C_4H_8O_2) + CH_3MgBr \xrightarrow{H_3O^+} C_4H_{10}O$
    $\qquad\qquad$ (2 parts) $\qquad\qquad$ (alcohol)
    $\qquad\qquad\qquad\qquad$ (B)

    Alcohol B reacts slowly with sodium metal. Hence A and B are

    (A) $CH_3-\overset{\overset{\displaystyle O}{\|}}{C}-O-C_2H_5$, $(CH_3)_3COH$ $\qquad$ (B) $H-\overset{\overset{\displaystyle O}{\|}}{C}-O-C_3H_7$, $(CH_3)_2CHOH$

    (C) $CH_3-\overset{\overset{\displaystyle O}{\|}}{C}-O-C_2H_5$, $(CH_3)_2CHOH$ $\qquad$ (D) $H-\overset{\overset{\displaystyle O}{\|}}{C}-O-C_3H_7$, $(CH_3)_3COH$

24. Which sodium salt will be heated with soda lime to obtain propane:

    (A) $CH_3 - CH_2 - \overset{\overset{\displaystyle}{|}}{\underset{\underset{\displaystyle O}{\|}}{C}} - O^-Na^+$ $\qquad\qquad$ (B) $CH_3 - CH_2 - CH_2 - \overset{}{\underset{\underset{\displaystyle O}{\|}}{C}} - O^-Na^+$

    (C) $(CH_3)_2 - CH - \overset{}{\underset{\underset{\displaystyle O}{\|}}{C}} - O^-Na^+$ $\qquad\qquad$ (D) 2 and 3 both

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25. What are A and B in the following reaction

(A)   &

(B) &

(C) &
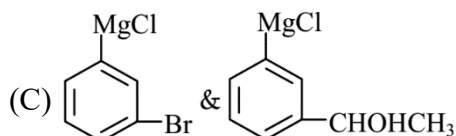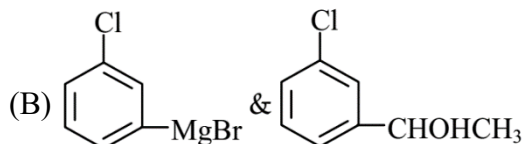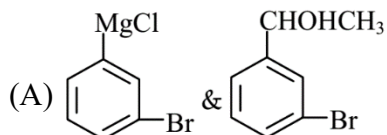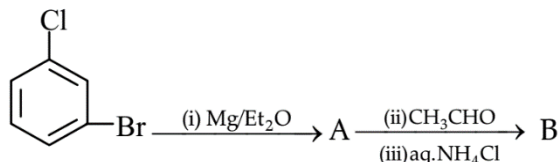
(D) None of these

26. A compound 'X' with molecular formula C_3H_8O can be oxidised to a compound 'Y' with the molecular formula $C_3H_6O_2$, 'X' is most likely to be:
(A) Primary alcohol   (B) Secondary alcohol
(C) Aldehyde   (D) Ketone

27. The relative order of reactivity of acyl derivatives is:

(A) $R-\overset{O}{\underset{||}{C}}-Cl > R-\overset{O}{\underset{||}{C}}-O-\overset{O}{\underset{||}{C}}-R > R-\overset{O}{\underset{||}{C}}-NH_2 > R-\overset{O}{\underset{||}{C}}-OR'$

(B) $R-\overset{O}{\underset{||}{C}}-Cl > R-\overset{O}{\underset{||}{C}}-OR' > R-\overset{O}{\underset{||}{C}}-O-\overset{O}{\underset{||}{C}}-R > R-\overset{O}{\underset{||}{C}}-NH_2$

(C) $R-\overset{O}{\underset{||}{C}}-Cl > R-\overset{O}{\underset{||}{C}}-O-\overset{O}{\underset{||}{C}}-R > R-\overset{O}{\underset{||}{C}}-OR' > R-\overset{O}{\underset{||}{C}}-NH_2$
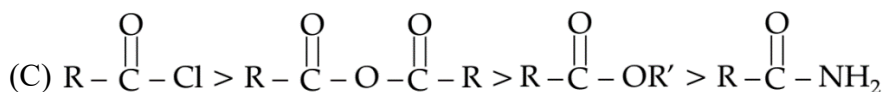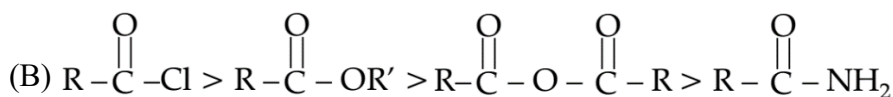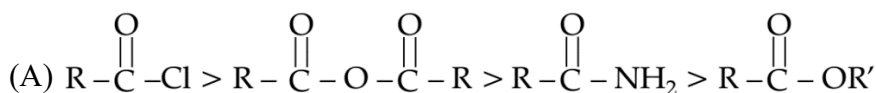
(D) None of the above

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28. Kjeldahl's method is used in the estimation of:
   (A) Nitrogen   (B) Halogens   (C) Sulphur   (D) Oxygen

29. In the Cannizzaro reaction given below: $2Ph\text{--}CHO \xrightarrow{OH^-} Ph\text{--}CH_2OH + Ph\bar{C}O_2$
   the slowest step is:
   (A) The attack of OH^- at the carbonyl group
   (B) The transfer of hydride to the carbonyl group
   (C) The abstraction of proton from the carboxylic group
   (D) The deprotonation of $Ph\text{--}CH_2OH$

30. The vapour pressure of solution obtained by mixing 0.2 mol of NaCl in 72g of water at 25°C will be
   …… torr. [Given: vapour pressure of water at 25°C is 24.2 torr] (Divide the answer by 11)
   (A) 2   (B) 4   (C) 6   (D) 8

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Biology (Section – C)

31. Occurrence of triploid (3n) primary endosperm nucleus is a characteristic feature of
    (A) algae   (B) gymnosperms   (C) angiosperms   (D) bryophytes

32. In water hyacinth and water lily, pollination takes place by
    (A) insects or wind   (B) water currents only
    (C) wind and water   (D) insects and water

33. The shared terminal duct of the reproductive and urinary system in the human male is
    (A) urethra   (B) ureter   (C) vas deferens   (D) vasa efferentia

34. Family planning programme was initiated in
    (A) 1920   (B) 1930   (C) 1950   (D) 1951

35. Which of the following is not a characteristic of an ideal contraceptive?
    (A) User-friendly   (B) Irreversible   (C) Easily available   (D) Least side-effects

36. Which of the following is a non-medicated intrauterine device (IUDs)?
    (A) CuT   (B) Lippes loop   (C) Cu7   (D) LNG-20

37. Which one of the following groups includes sexually transmitted infections?
    (A) AIDS, syphilis, haemophilia
    (B) HIV, cholera, trichomoniasis
    (C) Gonorrhoea, hepatitis-B, chlamydiasis
    (D) Hepatitis-B, Down's syndrome, sickle cell anaemia

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38. **Assertion:** Fetal disorders can be diagnosed by chorionic villi sampling.
    Reason: Karyotyping can be done for mitotically dividing cells of chorionic villi.
    (A) Both assertion and reason are true and reason is the correct explanation of assertion.
    (B) Both assertion and reason are true but reason is not the correct explanation of assertion.
    (C) Assertion is true but reason is false.
    (D) Both assertion and reason are false.

39. Which of the following contraceptive devices makes uterus unsuitable for implantation?
    (A) Progestasert   (B) CuT   (C) Lippe's loop   (D) Multiload

40. Study the given pedigree chart for sickle-cell anaemia and select the most appropriate option for the genotypes.
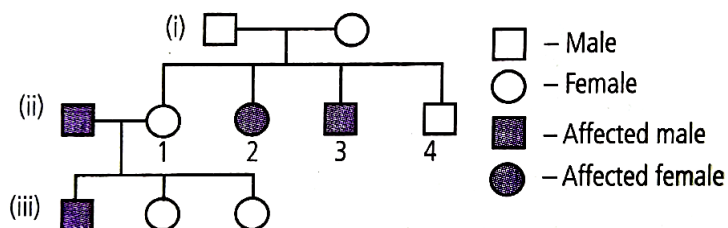
Genotypes of parents   **Genotypes of 1st and 3rd child in F_1**
(A) $Hb^A Hb^S$, $Hb^A Hb^A$ $Hb^A Hb^A$, $Hb^A Hb^S$
(B) $Hb^A Hb^S$, $Hb^A Hb^S$ $Hb^A Hb^A$, $Hb^A Hb^A$
(C) $Hb^A Hb^A$, $Hb^A Hb^S$ $Hb^A Hb^A$, $Hb^S Hb^S$
(D) $Hb^A Hb^S$, $Hb^A Hb^S$ $Hb^A Hb^S$, $Hb^S Hb^S$

41. Polyploidy in plants occurs due to
    (A) failure of cytokinesis during cell cycle   (B) segregation of chromatids
    (C) failure of separation of chromatids   (D) loss of chromosomes

42. In a cross between a male and female, both heterozygous for sickle cell anaemia gene, what percentage of the progeny will be diseased?
    (A) 100%   (B) 50%   (C) 75%   (D) 25%

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43. Frequency of recombination between gene pairs on same chromosome as a measure of the distance between genes to map their position on chromosome, was used for the first time by
   (A) Alfred Sturtevant   (B) Henking
   (C) Thomas Hunt Morgan   (D) Sutton and Boveri

44. Human genome consists of approximately
   (A) $3×10^9$ bp   (B) $6×10^9$ bp
   (C) 20,000 – 25,000 bp   (D) $2.2×10^4$ bp

45. Which of the following pairs is incorrectly matched?
   (A) Purines   -   Adenine and Guanine
   (B) Pyrimidines   -   Cytosine and Uracil
   (C) Nucleosides   -   Adenosine and Deoxythymidine
   (D) DNA   -   Basic biomolecule

46. Select the correct match of enzyme with its related function.
   (A) DNA polymerase   -   Synthesis of DNA strands
   (B) RNA polymerase   -   Synthesis of DNA
   (C) Ligase   -   Joins short DNA segments together
   (D) Both (A) and (C)

47. If the base sequence of a codon in mRNA is 5'-AUG-3', the sequence of tRNA pairing with it must be
   (A) 5' – UAC – 3'   (B) 5' – CAU – 3'   (C) 5' – AUG – 3'   (D) 5' – GUA – 3'

48. Match the following RNA polymerase with their transcribed products.
   (1) RNA polymerase I   (i) *t*RNA
   (2) RNA polymerase II   (ii) *r*RNA
   (3) RNA polymerase III   (iii) hnRNA
   Select the correct option from the following.
   (A) 1-i, 2-iii, 3-ii   (B) 1-i, 2-ii, 3-iii   (C) 1-ii, 2-iii, 3-i   (D) 1-iii, 2-ii, 3-i

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49. Which one of the following is the sequence on corresponding coding strand, if the sequence on mRNA formed is as follows?
   5' AUCGAUCGAUCGAUCGAUCGAUCG 3'?
   (A) 5' ATCGATCGATCGATCGATCGATCG 3'
   (B) 3' ATCGATCGATCGATCGATCGATCG 5'
   (C) 5' UAGCUAGCUAGCUAGCUAGCUAGC UAGC 3'
   (D) 3' UAGCUAGCUAGCUAGCUAGCUAGCUAGC 5'

50. DNA polymorphism forms the basis of
   (A) genetic mapping
   (B) DNA fingerprinting
   (C) both genetic mapping and DNA fingerprinting
   (D) translation

51. One of the oldest, best preserved and most complete hominid fossil in East African grasslands and used stone weapons for hunting was
   (A) *Australopithecus*   (B) *Oreopithecus*
   (C) *Dryopithecus*   (D) *Pithecanthropus*

52. Which one of the following scientist's name is correctly matched with the theory put forth by him?
   (A) de Vries – Theory of natural selection
   (B) Darwin – Theory of pangenesis
   (C) Mendel – Inheritable factors influence phenotypes
   (D) Pasteur – Theory of inheritance of acquired characters

53. Select the incorrect match.
   (A) Disruptive selection   -   Mean characters
   (B) Lamarck   -   Internal vital force
   (C) Migration   -   Gene frequency change
   (D) Darwin's finches   -   Unique to Galapagos

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54. In Miller's experiment, he used a mixture of CH_4, NH_3, H_2 and water vapour in a closed flask to mimic early earth conditions. What was the temperature at which this flask was kept?
(A) 800°C   (B) 1200°C   (C) 200°C   (D) 400°C

55. The wings of a bird and the wings of an insect are
(A) phylogenetic structures and represent divergent evolution
(B) homologous structures and represent convergent
(C) homologous structures and represent divergent evolution
(D) analogous structures and represent convergent evolution

56. The unwashed culture plate of growing mould where *Staphylococci* could not grow lead to the discovery of which antibiotic?
(A) Streptomycin   (B) Penicillin   (C) Tetracycline   (D) Both (A) and (B)

57. Which of the following statements is incorrect about gene therapy for ADA deficiency?
(A) Lymphocytes from patient's blood are taken out and cultured.
(B) A functional ADA-cDNA is introduced into these lymphocytes
(C) Lymphocytes are then re-introduced in the body of patient.
(D) Patient does not require periodic infusion of genetically engineered lymphocytes

58. In conventional diagnosis methods like serum analysis, the early detection of disease is not possible. The technique(s) that help in early detection of disease is/are
(A) DNA recombinant technology   (B) PCR
(C) ELISA   (D) all of these

59. Which of the following is not a functional component of ecosystem?
(A) Productivity   (B) Decomposition
(C) Energy flow   (D) Ecological pyramids

60. The amount of nutrients, such as carbon, nitrogen, phosphorus and calcium present in the soil at any given time, is referred as
(A) standing crop   (B) climax
(C) climax community   (D) standing state

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