RANKERS
JEE | NEET | FOUNDATION

RGP – RANKERS GENIUS PROGRAM

Set A

(Physics, Chemistry and Biology)

Time: 1 Hour | **Moving to Target (NEET)** | **Marks: 120**

1. General Instructions:

(Paper Code: 1303)

- *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:

- ✓ Exciting Cash Rewards for RGP Toppers

SENIOR WING (Student's Moving to Class XIth, XIIth, Dropper JEE /NEET)		JUNIOR WING (Student's Moving to Class IXth & Xth)	
Overall 1st Topper	₹ 21,000/-	Overall 1st Topper	₹ 5,100/-
Overall 2nd Topper	₹ 11,000/-	Overall 2nd Topper	₹ 3,100/-
Overall 3rd Topper	₹ 5,100/-	Overall 3rd Topper	₹ 2,100/-
Overall 4th – 8th Topper	₹ 2,100/-	Overall 4th – 8th Topper	₹ 1,100/-
Overall 9th – 15th Topper	₹ 1,100/-	Overall 9th – 15th Topper	₹ 500/-

** Rankings from 1 to 20 are determined based on the specific criteria outlined in the FAQ section of our website, www.myrankers.com.

4. Scholarship Criteria in Rankers Offline Classroom Program:

- ✓ 100% Fee Waiver – Student Scoring 90% and Above
- ✓ 80% Fee Waiver – Student Scoring 85% to 89.999%
- ✓ 60% Fee Waiver – Student Scoring 75% to 84.999%
- ✓ 50% Fee Waiver – Student Scoring 70% to 74.999%
- ✓ 40% Fee Waiver – Student Scoring 60% to 69.999%
- ✓ 20% Fee Waiver – Student Scoring 40 % to 59.999%
- ✓ 10% Fee Waiver – Student Scoring 30% to 39.999%
- ✓ 5% Fee Waiver – All the Aspirants Appearing in RGP

RGP RESULT & REWARD CEREMONY

Result Date: 12th Feb 2025
Check Your Result at: www.myrankers.com
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Student's Name: - .....

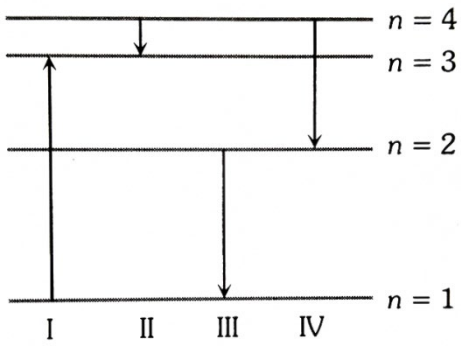
Physics (Section – A)

1. Column-I gives certain physical terms associated with flow of current through a metallic conductor. Column-II gives some mathematical relations involving electrical quantities. Match column-I and column-II with appropriate relations

Column I	Column II
A. Drift velocity	(P) $\frac{m}{ne^2\rho}$
B. Electrical resistivity	(Q) nev_d
C. Relaxation period	(R) $\frac{eE}{m}\tau$
D. Current density	(S) $\frac{E}{J}$

(A) (A)-(R), (B)-(S), (C)-(Q), (D)-(P)
(B) (A)-(R), (B)-(P), (C)-(S), (D)-(Q)
(C) (A)-(R), (B)-(Q), (C)-(S), (D)-(P)
(D) (A)-(R), (B)-(S), (C)-(P), (D)-(Q)

2. The diagram shows the energy levels for an electron in a certain atom. Which transition shown represents the emission of a photon with the most energy



(A) I
(B) II
(C) III
(D) IV

3. Two simple harmonic motions are represented by $y_1 = 4\sin\left(4\pi t + \frac{\pi}{2}\right)$ and $y_2 = 3\cos(4\pi t)$. The resultant amplitude is

(A) 7 (B) 1 (C) 5 (D) $2 + \sqrt{3}$ (E) $2 - \sqrt{3}$

---------- *Rough Work* ----------

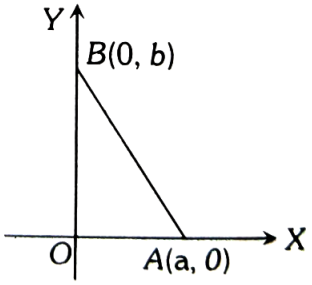
4. A charge +q is placed at the origin O of X-Y axes as shown in the figure. The work done in taking a charge Q from A to B along the straight line AB is

(A) $\frac{qQ}{4\pi\varepsilon_0}\left(\frac{a-b}{ab}\right)$

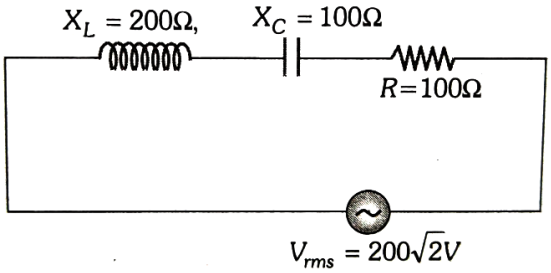
(B) $\frac{qQ}{4\pi\varepsilon_0}\left(\frac{b-a}{ab}\right)$

(C) $\frac{qQ}{4\pi\varepsilon_0}\left(\frac{b}{a^2}-\frac{1}{b}\right)$

(D) $\frac{qQ}{4\pi\varepsilon_0}\left(\frac{a}{b^2}-\frac{1}{b}\right)$



5. In the given circuit, rms value of current (I_{rms}) through the resistor R is



(A) $2A$ (B) $\frac{1}{2}A$ (C) $20\ A$ (D) $2\sqrt{2}A$

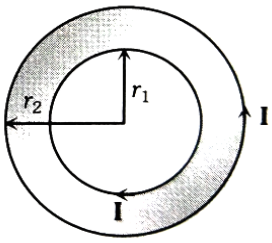
6. Two circular concentric loops of radii $r_1 = 20\text{cm}$ and $r_2 = 30\text{cm}$ are placed in the XY plane as shown in the figure. A current $I = 7$ amp is flowing through them. The magnetic moment of this loop system is

(A) $+4.0\hat{k}(Am^2)$

(B) $-1.5\hat{k}(Am^2)$

(C) $+1.1\hat{k}(Am^2)$

(D) $+1.3\hat{j}(Am^2)$



---------- *Rough Work* ----------

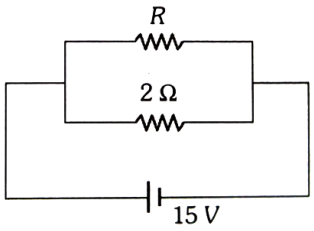
7. Math the C_P/C_V ratio for ideal gases with different type of molecules

A. Monoatomic	(I)	7/5
B. Diatomic rigid molecules	(II)	9/7
C. Diatomic non-rigid molecules	(III)	4/3
D. Triatomic rigid molecules	(IV)	5/3

(A) A-IV, B-I, C-II, D-III (B) A-IV, B-II, C-I, D-III
(C) A-III, B-IV, C-II, D-I (D) A-II, B-III, C-I, D-IV

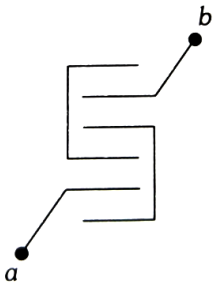
8. If in the circuit, power dissipation is 150 W, then R is

(A) 2 Ω
(B) 6 Ω
(C) 5 Ω
(D) 4 Ω



9. Plates of area A are arranged as shown. The distance between each plate is d, the net capacitance is

(A) $\frac{\varepsilon_0 A}{d}$
(B) $\frac{7\varepsilon_0 A}{d}$
(C) $\frac{6\varepsilon_0 A}{d}$
(D) $\frac{5\varepsilon_0 A}{d}$



---------- *Rough Work* ----------

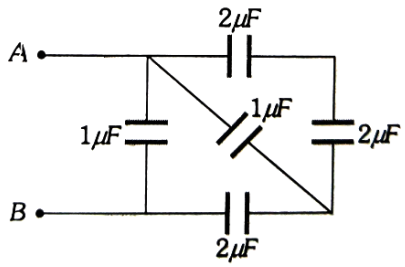
10. The total capacity of the system of capacitors shown in the adjoining figure between the points A and B is

(A) 1μF

(B) 2μF

(C) 3μF

(D) 4μF



11. The height vertically above the earth's surface at which the acceleration due to gravity becomes 1% of its value at the acceleration due to its value at the surface is (R is the radius of the earth)

(A) 8R (B) 9R (C) 10R (D) 20R

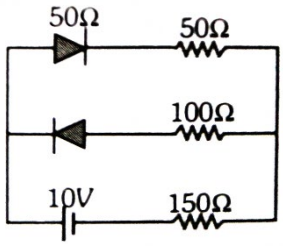
12. Assume that each diode shown in the figure has a forward bias resistance of 50Ω and an infinite reverse bias resistance. The current through the resistance 150Ω is

(A) 0.66 A

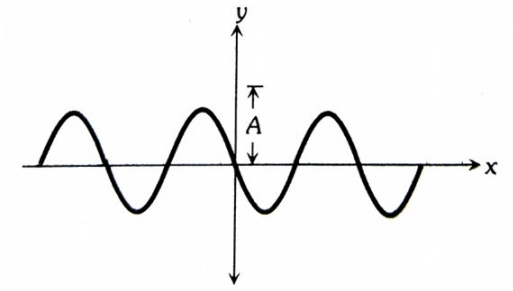
(B) 0.05 A

(C) Zero

(D) 0.04 A



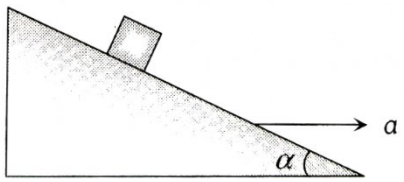
13. A progressive wave travelling along the positive x-direction is represented by $y(x,t) = \text{A}\sin(kx - \omega t + \phi)$. Its snapshot at $t = 0$ is given in the figure For this wave, the phase ϕ is



(A) 0 (B) $-\frac{\pi}{2}$ (C) π (D) $\frac{\pi}{2}$

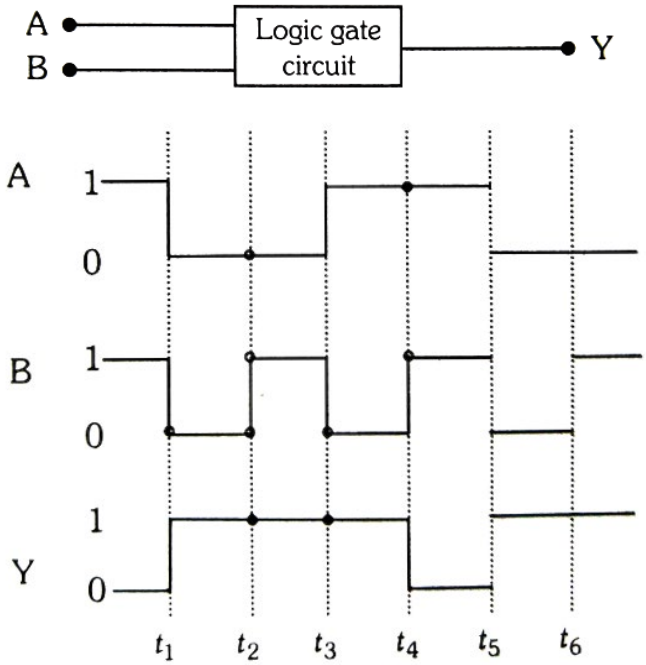
---------- *Rough Work* ----------

14. A block is kept on a frictionless inclined surface with angle of inclination 'α'. The incline is given an acceleration 'a' to keep the block stationary. Then a is equal to



(A) g (B) g tan α (C) g/tan α (D) g coesc α

15. The following figure shows a logic gate circuit with two inputs A and B and the output Y. The voltage waveforms of A, B and the output Y are as given



The logic gate is

(A) NOR gate (B) Or gate (C) AND gate (D) NAND gate

---------- *Rough Work* ----------

Chemistry (Section – B)

16. Which of the following compound is not formed in haloform reaction?
(A) CHF_3 (B) $CHCl_3$ (C) CHI_3 (D) $CHBr_3$

17. Which of the following is a non-reducing sugar?
(A) Lactose (B) Fructose (C) Sucrose (D) Maltose

18. Match List-I will List-II:

List – I	**List – II**
Solid salt treated with dil. H_2SO_4	Anion detected
A. effervescence of colourless gas	I. NO_2^-
B. gas with smell of rotten egg	II. CO_3^{2-}
C. gas with pungent smell	III. S^{2-}
D. brown fumes	IV. SO_3^{2-}

Choose the correct answer from the options given below:
(A) A-II, B-III, C-IV, D-I (B) A-IV, B-III, C-II, D-I
(C) A-I, B-II, C-III, D-IV (D) A-II, B-III, C-I, D-IV

19. What will be the equilibrium constant of reaction, A + B ⇌ C + D. If initially the concentration of A and B are equal but at equilibrium concentration of D will be twice of that of A.
(A) 4/9 (B) 9/4 (C) 1/9 (D) 4

20. Which of the following is an example of a reducing agent?
(A) Oxygen (O_2) (B) Hydrogen peroxide (H_2O_2)
(C) Sodium chloride (NaCl) (D) Sodium hydroxide (NaOH)

---------- *Rough Work* ----------

21. What is the symbol for the SI unit of mole, and how is the mole defined?
(A) mol; It is defined as the amount of a substance that contains as many particles or entities as there are atoms in exactly 12 g (0.012 kg) of the 12C isotope.
(B) mol; It is defined as the amount of a substance that contains 6.02×10^{23} particles.
(C) mo; It is defined as the amount of a substance that contains 1 g of the substance.
(D) ml; It is defined as the amount of a substance that contains 1 liter of the substance.

22. Electrolytic reduction of nitrobenzene in weakly acidic medium gives
(A) N – phenylhydroxylamine (B) Nitrosobenzene
(C) Aniline (D) p – hydroxyaniline

23. The van't Hoff factor, i for a compound which undergoes dissociation in one solvent and association in other solvent is respectively.
(A) less than one and less than one
(B) greater than one and less than one
(C) greater than one and greater than one
(D) less than one and greater than one

24. Who is known for the development of the Periodic Table?
(A) Johann Dobereiner (B) Dmitri Mendeleev
(C) Marie Curie (D) Ernest Rutherford

25. The species which acts as electrophile in the bromination of benzene is
(A) Br_2 (B) Br^- (C) Br^+ (D) Br^*

---------- *Rough Work* ----------

26. The $[H^+]$ of a resulting solution that is 0.01M acetic acid ($K_a = 1.8 \times 10^{-5}$) and 0.01 M in benzoic acid ($K_a = 6.3 \times 10^{-5}$) is
(A) 9×10^{-4} (B) 81×10^{-4} (C) 9×10^{-5} (D) 2.8×10^{-3}

27. How can the internal energy of a system be increased without transferring any heat to the system?
(A) By doing work on the system
(B) By decreasing the temperature of the system
(C) By increasing the entropy of the system
(D) None of the above

28. The standard reduction potential E° for the half reactions are as:
$Zn^{2+} + 2e^- \rightarrow Zn, \quad E° = -0.76\ V$
$Cu^{2+} + 2e^- \rightarrow Cu, \quad E° = 0.34\ V$
The standard cell voltage for the cell reaction is?
$Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$
(A) 0.42 V (B) – 0.42 V (C) – 1.1V (D) 1.10 V

29. The diameter of zinc atom is 2.6 Å. Calculate radius of zinc atom in pm
(A) 150 pm (B) 145 pm (C) 130 pm (D) 128 pm

30. According to Henry's law, the solubility of a gas in a given volume of liquid increases with increase in:
(A) Temperature (B) Pressure
(C) Both (A) and (B) (D) None of these

---------- *Rough Work* ----------

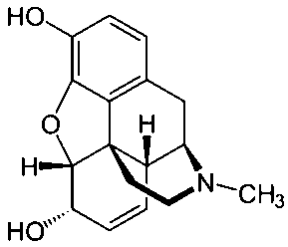
Biology (Section – C)

31. Which of the following is not a natural/traditional contraceptive method?
(A) Periodic abstinence
(B) Lactational amenorrhea
(C) Vaults
(D) Coitus interrupts

32. At which state of life the oogenesis process is initiated?
(A) Adult
(B) Puberty
(C) Embryonic development stage
(D) Birth

33. Which of the following statements are true for spermatogenesis but do not hold true for Oogenesis?
A. It results in the formation of haploid gametes
B. Differentiation of gamete occurs after the completion of meiosis
C. Meiosis occurs continuously in a mitotically dividing stem cell population
D. It is controlled by the Luteinising hormone (LH) and Follicle Stimulating Hormone (FSH) secreted by the anterior pituitary
E. It is initiated at puberty
Choose the most appropriate answer from the option given below:
(A) B, C and E only
(B) C and E only
(C) B and C only
(D) B, D and E only

34. The receptors for the drug shown below are located in:



(A) CNS and CVS
(B) CVS and GIT
(C) CNS and GIT
(D) CNS and PNS

---------- *Rough Work* ----------

35. Ringworm in humans can be caused by infection ill all the following except:
(A) Microsporum (B) Taenia
(C) Trichophyton (D) Epidermophyton

36. An example of ex situ conservation is
(A) National Park (B) Seed Bank
(C) Wildlife Sanctuary (D) Sacred Grove

37. How many hotspots of biodiversity in the world have been identified till date by Norman Myers?
(A) 17 (B) 34 (C) 25 (D) 43

38. Barnacles growing on the back a whale, a type of population interaction, is an example of
(A) Competition (B) Mutualism
(C) Amensalism (D) Commensalism

39. Which of the following is not a yeast derived product?
(A) Statins (B) Cyclosporin A
(C) Ethanol (D) Bread

40. Propionibacterium sharmanii is responsible for
(A) Large holes in Roquefort cheese
(B) Large holes in Swiss Cheese
(C) Ripening of Roquefort Cheese
(D) Ripening of Swiss cheese

---------- *Rough Work* ----------

41. Toddy is prepared by
(A) Fermentation of sap from palms
(B) Fermentation of latex from todes
(C) Fermentation of latex from coconut
(D) Fermentation of leaves from conifers

42. Semi-conservative nature of the replication of eukaryotic chromosome was experimentally demonstrated by
(A) Chains (B) Meselson and Stahl
(C) Hebert Taylor (D) Hershey and Chase

43. Cytidine is a
(A) nucleoside (B) nitrogen base
(C) nucleotide (D) nucleic acid

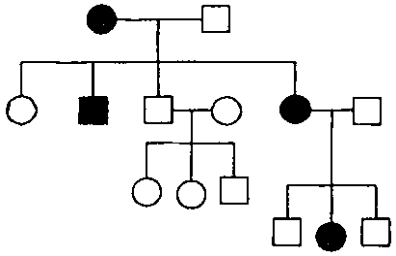
44. If a segment of an mRNA molecule has the sequence 5' GUACCGAUCG 3', which of the following could have been the template DNA molecule?
(A) 3' GCUAGCCAUG 5' (B) 3' GUACCGAUCG 5'
(C) 3' CATGGCTAGC 5' (D) 3' CGATCGGTAC 5'

45. A disease caused by an autosomal primary non-disjunction is:
(A) Klinefelter's Syndrome (B) Turner's Syndrome
(C) Sickle Cell Anaemia (D) Down's Syndrome

46. If both parents are carriers for thalassaemia, which is an autosomal recessive disorder, what are the chances of pregnancy resulting in an affected child?
(A) 25% (B) 100% (C) No chance (D) 50%

---------- *Rough Work* ----------

47. Study the pedigree chart of a family showing the inheritance of myotonic dystrophy.



The trait under study is

(A) Dominant X-linked
(B) Recessive X-linked
(C) Autosomal dominant
(D) Recessive Y-linked

48. Which of the following statements is false?
(A) Some 2000 years old viable seeds of Pheonix dactylifera were discovered during archaeological excavation of King Herod's palace near Dead Sea
(B) Record of 10,000 years of dormancy of seeds has been estimated in Lupinus arcticus
(C) The number of seeds in each fruit in case of orchid and some parasitic forms like Orobanche and Striga is one
(D) Many fruits have evolved mechanisms for dispersal of seeds

49. Which of the following event is second in the action of Bt toxin?
(A) Binding to epithelial cells
(B) Creating pores
(C) Swelling
(D) Lysis

50. Select the correct order of processing of PCR.
(A) Extension, primer annealing, denaturation
(B) Denaturation, primer annealing, extension
(C) Denaturation, extension, primer annealing
(D) Primer annealing, denaturation, extension

---------- *Rough Work* ----------

51. The theory of special creation was strongly challenged during the nineteenth century on the basis of observation made
(A) During a sea voyage in a sail ship called H.M.S. Beagle round the Europe
(D) During a sea voyage in a sail ship called M.H.S. Beagle round the Africa
(C) During a sea voyage in a sail ship called H.M.S. Beagle round the world
(D) During a sea voyage in a sail ship called M.H.S. Beagle round the world

52. Which one of these animals is not a homeotherm?
(A) Macropus (B) Chelone
(C) Camelus (D) Psittacula

53. In which of the following are air sacs connected to the lungs?
(A) Neophron (B) Testudo
(C) Ornithorhynchus (D) Chelone

54. Which of the following is not true for cerebrum?
(A) Forms the major part of the human brain
(B) A deep cleft divides transversely into two halves
(C) Cerebral hemispheres are longitudinal halves
(D) The hemispheres are connected by a tract of nerve fibres called corpus callosum

55. If a segment of an mRNA molecule has the sequence 5' GUACCGAUCG 3', which of the following could have been the template DNA molecule?
(A) 3' GCUAGCCAUG 5' (B) 3' GUACCGAUCG 5'
(C) 3' CATGGCTAGC 5' (D) 3' CGATCGGTAC 5'

---------- *Rough Work* ----------

56. The total number of nitrogenous bases in human genome is estimated to be about
(A) 3.5 million (B) 35 thousand
(C) 35 million (D) 3.1 billion

57. Assertion (A): The wall of atria release ANF in response to high blood pressure and blood volume.
Reason (R): ANF is a vasodialator and inhibits the release of renin to lower blood pressure.
(A) Both (A) and (R) are true and (R) is the correct explanation of (A).
(B) Both (A) and (R) are true but (R) is not the correct explanation of (A).
(C) (A) is true but (R) is false.
(D) Both (A) and (R) are false.

58. How many nuclei participates in double fertilisation?
(A) 2 (B) 5 (C) 4 (D) 3

59. Consider the given statements carefully.
(a) Malpighian tubules help in the removal of nitrogenous wastes and osmoregulation in Periplaneta.
(b) Flame cells are the excretory structure in Planaria as well as rotifers.
(c) Each kidney of an adult human measures 0.1 to 0.12 meters in width.
(d) Kidneys are situated between the level of the last thoracic and fourth lumbar vertebra.
Select the option with correct statements only:
(A) a, b, c, and d (B) a and b
(C) a, c, and d (D) a, b, and c

60. Which of the following has the least pollen viability?
(A) Cereals like wheat and rice
(B) Members of Rosaceae
(C) Members of Leguminoseae
(D) Members of Solanaceae

---------- *Rough Work* ----------