



PART – A

1. Arrange the given words in alphabetical order and choose the one that comes last.
A) Afford B) Avoid C) Answer D) Awesome

Direction Q. 2 : A foreign expression and four English phrases are given. Identify the meaning of the foreign expression from the choices.

2. Status quo
A) Unalterable condition B) Existing state of affairs
C) Relative importance D) Social position

Direction Q. 3 : Identify the meaning of underlined word as used in the sentence, from among four alternatives.

3. Vijaya was decorous in her speech and behavior and she was appreciated by all for her conduct.
A) relaxed B) proper C) hesitant D) enthusiastic

Direction Q. 4 : An idiom and four possible meaning are given, identify the meaning of the idiom from among the answer choices.

4. Lie low
A) to cease fighting B) destructively active
C) hide and wait D) do nothing except relax

Direction Q. 5 : Fill in the blanks in the given sentence to make it logically and grammatically correct.

5. It is very misleading to imagine that computers can _____ like people.
A) think B) succeed C) perorate D) deal

Direction Q. 6 : A sentence is written in four different forms. Only one of them is grammatically correct. Choose the correct sentence as your answer.

6. A) There are no loss than fifty students in the class.
B) There are no fewer than fifty students in the class.
C) There are not fewer than fifty students in the class.
D) There are not lesser fewer than fifty students in the class.

Direction Q. 7 : Four alternative substitutes are given for the underline portion. Identify the choice that replace the underline part to form a logical and grammatically correct statement.

7. I will come back tomorrow unless there is a bus strike.
A) unless there is a bus strike B) if there is a bus strike
C) in case there is a bus strike D) unless there is no bus strike



Direction Q. 8 : A word and four jumbled choices are given. One of the choices, when properly arranged, give the meaning of the word. Identify the correct choice.

8. IMPORTANT

A) GRINETYTI

B) FIDIFULCT

C) NCIGIANSIFT

D) NLAFI

Direction Q. 9 : From the choices, select the most suitable synonym for the main word.

9. FLEETING

A) enigmatic

B) epidural

C) ephemeral

D) everlasting

Direction Q. 10 : From the choices, select the most suitable antonym for the main word.

10. BOLSTER

A) undermine

B) interdict

C) support

D) contradict

Direction Q. 11 : There is a certain relation between two given words on one side of :: and one word is given on another side of :: while another word is to be found from the given alternatives , having the same relation with this word as the given pair has. Select the best alternative.

11. Oxygen : Burn :: Carbon dioxide : ?

A) Isolate

B) Foam

C) Extinguish

D) Explode

Direction Q. 12 : There is a certain relation between two given numbers on one side of :: and one number is given on another side of :: while another number is to be found from the given alternatives , having the same relation with this number as the given pair has. Select the best alternative.

12. 7 : 56 :: 9 : ?

A) 63

B) 81

C) 90

D) 99

Direction Q. 13 : In the given question, four words have been given, out of which three are alike in some manner and the fourth one is different. Choose out the odd one.

13. A) Blade

B) Axe

C) Scissors

D) Needle

Direction Q. 14 : In the given question, four numbers are given. Out of these, three are alike in a certain way but the rest one is different. Choose the one which is different from the rest three.

14. A) 35

B) 56

C) 50

D) 63

Direction Q. 15 : In the given question, a number series is given with one term missing. Choose the correct alternative that will continue the same pattern.

15. 3,7,15,31,63,

A) 92

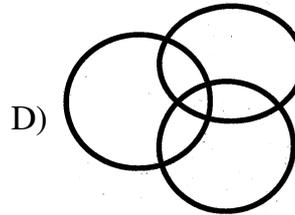
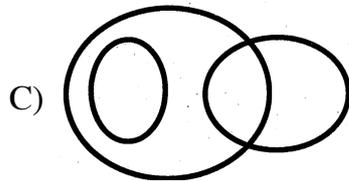
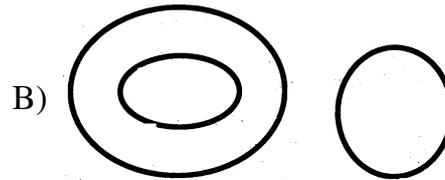
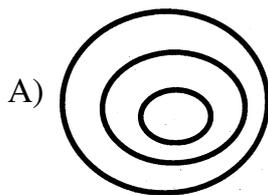
B) 115

C) 127

D) 131



16. If in a certain language, ROBUST is coded as QNATRS, which word would be coded as ZXCMP ?
 A) YWBLO B) YYBNO C) AWDLQ D) AYDNQ
17. Which of the following diagrams correctly represents Rhombus, Quadrilaterals, Polygons ?



18. If x stands for 'add', y stands for 'subtract', z stands for 'divide' and p stands for 'multiply', then what is the value of $(7 \text{ p } 3) \text{ y } 6 \text{ x } 5 \text{ z } 1$?
 A) 5 B) 10 C) 15 D) 20
19. If a number, when divided by 4, is reduced by 21, the number is
 A) 18 B) 20 C) 28 D) 38
20. On a scale of map, 0.6 cm represents 6.6 km. If the distance between the points on the map is 80.5 cm, the actual distance between these points is
 A) 9 km B) 72.5 km C) 190.75 km D) 885.5 km
21. A train 360 m long is running at a speed of 45 km/hr. In what time, will it pass a bridge 140 m long ?
 A) 40 second B) 42 second C) 45 second D) 48 second
22. From which book has the National Song 'Vande Mataram' been taken ?
 A) Anand Math B) Neel Darpan C) Geetanjali D) Satyarth Prakash
23. Which article of the Constitution is directly applicable to Jammu and Kashmir ?
 A) Article 371 B) Article 370 C) Article 375 D) Article 376
24. Which of the following is Anti Virus Software ?
 A) Java B) Tally C) Norton D) Block chain
25. On 15th February 2017, ISRO's PSLV-C37 made news by launching a record number of satellites in space. This number was
 A) 100 B) 102 C) 103 D) 104



35. Testing hypothesis is
- A) Inferential statistics
 - B) Descriptive statistics
 - C) Data preparation
 - D) Data analysis
36. In research, something that doesn't "vary" is called a
- A) Variable
 - B) Method
 - C) Constant
 - D) Control group
37. The group that receives the experimental treatment condition is the
- A) Experimental group
 - B) Control group
 - C) Participant group
 - D) Independent group
38. Controlled group condition is applied in
- A) Survey research
 - B) Historical research
 - C) Experimental research
 - D) Descriptive research
39. Action research means
- A) A longitudinal research
 - B) An applied research
 - C) A research initiated to solve an immediate problem
 - D) A research with socio-economic objective
40. Formulation of hypothesis may not be required in
- A) Survey method
 - B) Historical studies
 - C) Experimental studies
 - D) Normative studies
41. The research is always
- A) Exploring new knowledge
 - B) Verifying the old knowledge
 - C) Filling the gap between the knowledge
 - D) Including all the above
42. The ethics in research is not related to
- A) Self interest
 - B) Scientific method
 - C) Reliability
 - D) Humanity



43. h-Index can be calculated for
- A) Whole institute
 - B) A department of an Institute
 - C) An individual scientist
 - D) All of the above
44. Plagiarism is
- A) Survey
 - B) Results of an experiment
 - C) Research output of a scientist
 - D) Copying some other scientist's research data under your name
45. The probability of an experiment/event can't be
- A) - 0.5
 - B) 0.5
 - C) 0.3
 - D) 1.0
46. A reasoning where we start with certain particular statements and conclude with a universal statement is called
- A) Deductive reasoning
 - B) Transcendental reasoning
 - C) Inductive reasoning
 - D) Abnormal reasoning
47. In the process of conducting research "Formulation of Hypothesis" is followed by
- A) Collection of data
 - B) Analysis of data
 - C) Selection of research tools
 - D) Statement of objectives
48. Conference proceedings are considered as _____ document.
- A) Conventional
 - B) Primary
 - C) Secondary
 - D) Tertiary
49. Questionnaire is a
- A) Research method
 - B) Measurement technique
 - C) Tool for data collection
 - D) Data analysis technique
50. Which of the following is not covered under Intellectual Property Right ?
- A) Copyright
 - B) Patents
 - C) Trademark
 - D) Thesaurus



PART – B

51. When Reynold number is higher than _____ for Newtonian fluids, the laminar flow disappears.
A) 4000 B) 3000 C) 2100 D) 1500
52. If a 5 μm particle is crushed into number of 5 nm particles (assuming there is no weight loss), the total surface area of nanoparticles in comparison to one 5 μm particle
A) increases B) decreases
C) never changes D) random
53. Welded stainless steel suffers from
A) stress corrosion B) intergranular corrosion
C) crevice corrosion D) erosion corrosion
54. Wiedemann-Franz law is related to
A) optical properties of thin films B) thermal conductivity of metals
C) mobility of charge carriers D) deformation in plastics
55. What is the most important the material requirement to have creep resistance property ?
A) Low melting point B) High oxidation resistance
C) High melting point D) High strain rate
56. Which process is used to remove internal stresses from a metal ?
A) Annealing B) Cold working C) Sintering D) Carburizing
57. On heating one solid phase transforming to a solid and a liquid phase is known as
A) peritectic reaction B) eutectic reaction
C) hypoeutectic reaction D) hypereutectic reaction
58. In solid oxide fuel cells, the conductivity arise due to
A) electrons B) ions C) protons D) water
59. For metallic nanoparticles, the phenomenon of electron cloud that can oscillate on the particle surface and its interaction with electromagnetic radiation is known as
A) photoemission B) light scattering
C) fluorescence D) plasmon absorbance
60. From the following which statement is not true about the composites ?
A) Composites are multiphase materials
B) It is possible to tailor the properties of composites
C) Rule of mixtures is not useful to elucidate the composite properties
D) In fiber reinforced composites, the applied load is transmitted to the fibers



61. Magnetic hysteresis does not depend on which property ?
A) elastic stress
B) preferential orientation in polycrystalline material
C) single or polycrystalline nature
D) pores
62. The relation between edge length 'a' (or unit cell size) and atomic radius 'r' in a body centered cubic (BCC) structure is given by a =
A) $4r/\sqrt{3}$ B) $4r/\sqrt{2}$ C) $2r/\sqrt{3}$ D) $2r/\sqrt{2}$
63. What is the effect of temperature on stiffness of a metal ?
A) Temperature has no effect on stiffness of a metal
B) As temperature increases stiffness of metal decreases
C) As temperature increases stiffness of metal increases
D) None of the above
64. The nose cone of the space shuttles which are exposed to high temperature is having a protective coating made up of
A) SiC B) Duralumin C) Invar D) Kevlar
65. Which rubbers are used for automobile tyres ?
A) Polyurethane rubbers B) ECH rubbers
C) Vinyl rubbers D) Butyl rubbers
66. The coalescence of powder particles under the influence of temperature to form a dense mass is known as
A) casting B) vitrification C) pressing D) sintering
67. The property of time dependent changes in elasticity is known as
A) viscoelasticity B) Young's modulus
C) anelasticity D) plasticity
68. Frenkel defect means
A) Defect in which interstitial position is occupied by missing atoms
B) Defect in which positive ions are missing
C) Defect in which interstitial position is occupied by extra atom in the crystal without disorganizing the parent atom
D) Defect in which negative ions are missing



87. Pilling-Bedworth ratio is related to
- A) corrosion rate of turbine blades
 - B) dispersion strengthening
 - C) oxygen vacancy mobility
 - D) tendency for the formation of protective oxide of metal
88. The scattering of particles by a potential can be analyzed by Born approximation. In particular, if the scattered wave is replaced by an appropriate plane wave, the corresponding Born approximation is known as the first Born approximation. Such an approximation is valid for
- A) Large incident energies and weak scattering potentials
 - B) Large incident energies and strong scattering potentials
 - C) Small incident energies and weak scattering potentials
 - D) Small incident energies and strong scattering potentials
89. A solid material is found to have a temperature independent magnetic susceptibility, $\chi = C$. Which of the following statements is correct ?
- A) If C is positive, the material is a diamagnet
 - B) If C is positive, the material is a ferromagnet
 - C) If C is negative, the material could be a type I superconductor
 - D) If C is positive, the material could be a type I superconductor
90. At pH 7.2 and 10 Torr oxygen partial pressure, the extent of O₂ binding is
- A) High for both hemoglobin and myoglobin
 - B) High for hemoglobin and low for myoglobin
 - C) High for myoglobin and low for hemoglobin
 - D) Low for both hemoglobin and myoglobin
91. A steel body is under relative motion over the other body made up of any of the following material. In which case, a maximum friction will be observed
- A) aluminum
 - B) copper
 - C) wood
 - D) steel
92. A narrow beam of X-rays with wavelength 1.5 Å is reflected from an ionic crystal with an fcc lattice structure with a density of 3.32 gcm⁻³. The molecular weight is 108 AMU (1AMU = 1.66 × 10⁻²⁴ g). The lattice constant is
- A) 6.00 Å
 - B) 4.56 Å
 - C) 4.00 Å
 - D) 2.56 Å



93. A magnetic field sensor based on the Hall Effect is to be fabricated by implanting As into a Si film of thickness $1\ \mu\text{m}$. The specifications require a magnetic field sensitivity of $500\ \text{mV/Tesla}$ at an excitation current of $1\ \text{mA}$. The implantation dose is to be adjusted such that the average carrier density, after activation, is
- A) $1.25 \times 10^{26}\ \text{m}^{-3}$ B) $1.25 \times 10^{22}\ \text{m}^{-3}$
C) $4.1 \times 10^{21}\ \text{m}^{-3}$ D) $4.1 \times 10^{20}\ \text{m}^{-3}$
94. The physical phenomenon that cannot be used for memory storage applications is
- A) Large variation in magnetoresistance as a function of applied magnetic field
B) Variation in magnetization of a ferromagnet as a function of applied magnetic field
C) Variation in polarization of a ferroelectric as a function of applied electric field
D) Variation in resistance of a metal as a function of applied electric field
95. Among the following elements which can diffuse faster in iron ?
- A) C B) Ni C) H D) Cr
96. Pitting refers to
- A) a galvanic couple B) a form of corrosion
C) stress D) swelling of polymers
97. A phosphorous doped silicon semiconductor (doping density : $10^{17}/\text{cm}^3$) is heated from 100°C to 200°C . Which one of the following statements is CORRECT ?
- A) Position of Fermi level moves towards conduction band
B) Position of dopant level moves towards conduction band
C) Position of Fermi level moves towards middle of energy gap
D) Position of dopant level moves towards middle of energy gap
98. The welding process which uses a blanket of fusible granular flux is
- A) Tungsten inert gas welding B) Submerged arc welding
C) Electroslag welding D) Thermit welding
99. The value of true strain produced in compressing a cylinder to half its original length is
- A) 0.69 B) -0.69 C) 0.5 D) -0.5
100. Among the following techniques which is not useful for providing size information of materials ?
- A) Transmission electron microscopy B) X-ray Diffraction
C) Infra-red D) Atomic Force Microscopy
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SPACE FOR ROUGH WORK