

Model Test-1

TOTAL FULL MARKS: 100
PASS MARKS: 45

B. Arch. / B. E. Entrance Exam

TIME- 02:00 hrs

Choose the precise answer to the following and tick (✓) on the attached

ANSWER SHEET

Read carefully the '**Direction**', answer the questions. All questions carry equal marks.

Direction: Select the appropriate choice

English

Read the following passage and answer the questions by blackening the appropriate bubble.

All transportation is resource-consuming and pollution-generating. In so far as a transport system uses energy, burns fuel, occupies and degrades valuable land, creates noise, emits fumes, it is damaging to environment. Even so, modern urban societies continue to make ever greater demands on their transportation systems because mobility is also a means of expanding, or at least better utilizing the available resource base- a way of improving the environment. In comparison with most other activities, urban transportation is highly polluting and affects a large number of people. Most of our cities have buses, taxis, scooters and other vehicles. The pollution generated by these vehicles depends on the energy source used. With electric traction the local pollution is the minimum, but it has been shifted to where the power is generated.

Questions:

- Resources are consumed by
a. Transport b. fuel c. land d. energy
- Land is occupied by
a. Trees b. environment c. pollution d. system of transport
- Transport systems are needed by
a. Children b. travelers c. land owners d. urban societies
- Transport systems are harmful, because these
a. Use energy b. divide the city c. cause pollution d. kill people
- Use of electric traction implies
a. A lot of pollution b. no pollution c. shifting of pollution to another place d. quick travelling
- He has a high enthusiasm. What does the word 'enthusiasm' mean?
a. Popularity b. interest c. demand d. salary
- Which of the following is correct?
a. Neither Hari nor his brother have a book.

- b. Neither Hari nor his brother were a book.
 c. Neither Hari nor his brother read a book.
 d. Neither Hari nor his brother has a book.
8. Which of the following is not acceptable?
 a. Put off b. get off c. see off d. eat off
9. One of themthe job.
 a. Have lost b. will lost c. lose d. has lost
10. Our courseby Friday.
 a. Has completed b. was complete c. will complete d. will have been completed
11. Ten kilometers..... a great distance.
 a. Is b. are c. were d. being
12. You'd better stop,?
 a. Hadn't you? b. had you? c. wouldn't you? d. would you?
13. The passive voice of 'She helped me' is
 a. I helped her b. She was helped by me
 b. c. I am helped by her d. I was helped by her
14. Which of the following expressions means 'overflow'?
 a. Run up to b. run over c. run away d. run in
15. I warned her not to watch horror films.
 a. I warned to her, "Don't watch horror films".
 b. I said to her, "Don't watch horror films".
 c. I warned her, "Don't watch horror films".
 d. I asked her. "Don't watch horror films".
16. Which of the following is acceptable?
 a. I solved as hard problems as them.
 b. I am as tall as him.
 c. They are as strong as them.
 d. She is as intelligent as us.
17. A small piece of wood is
 a. Splinter b. crumb c. chip d. scrap
18. Which of the following is correct?
 a. Since when have you been working for her?
 b. When since have you been working for her?
 c. Since have you been working for her?
 d. When have you been working for her since?
19. If you invited him, he.....
 a. Would come b. would have come c. will come d. must come
20. She would not pass the examination.....ill health.
 a. Because b. because of c. since d. in order to

21. Theythat they had already finished their meal.
 a. Says b. will say c. said d. has said
22. I look forwardmeeting you very soon.
 a. At b. to c. for d. with
23. Keepthere.
 a. sit b. to sit c. sitting d. sat
24. The diminutive of 'owl' is
 a. owlen b. owlet c. owldom d. owlock
25. Which of the following is spelled correctly?
 a. luxuriant b. luxerent c. luxjurant d. laxariant

Math

26. If $n(A)=5$, then the number of non-empty proper subsets of set A is
 a) 32
 b) 31
 c) 30
 d) 29
27. The mappings $f:A \rightarrow B$ and $g:A \rightarrow B$ are equal if
 a) $\{f(x): x \in A\} = \{g(x): x \in A\}$
 b) $\{f(x): x \in A\} \subset \{g(x): x \in A\}$
 c) $f(x) = g(x)$ for every $x \in A$
 d) none of the above
28. If f and g are two functions which are inverse of each other, then $f \circ g(x)$ is
 a) 1 b) x c) 1/x d) x^{-2}
29. In a ΔABC , the sine law is
 a) $\frac{A}{\sin A} = \frac{B}{\sin B} = \frac{C}{\sin C}$
 b) $\frac{a}{\sin B} = \frac{b}{\sin C} = \frac{c}{\sin A}$
 c) $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
 d) $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$ ans:C

30. The value of x satisfying $5 \tan^{-1} x + 3 \cot^{-1} x = 2\pi$ is

- a) 0 b) 1 c) $\sqrt{3}$ d) 2

31. Two lines $ax+by+c=0$ and $ax+by+k=0$ are on opposite sides of origin if

- a) c and k are of opposite signs
b) c and k are of same signs
c) $c=k=0$
d) None of these

32. If $w^3 = 1$ then $\frac{cw^2+bw+a}{b+cw+aw^2} =$

- a) 1
b) w
c) w^2
d) 0

33. If A^T be the transpose of a matrix A then

- a) $|A| = |A^T|$
b) $|A| < |A^T|$
c) $|A| > |A^T|$
d) none

34. The value of the determinant $\begin{vmatrix} 1! & 2! & 3! \\ 2! & 3! & 4! \\ 3! & 4! & 5! \end{vmatrix}$ is

- a) 0 b) 1! c) 4! d) 5!

35. The sum of first n even natural numbers is

- a. $n^2 + n$
b. $n^2 - n$
c. n^2
d. $\frac{n(n+1)}{2}$

36. If $a * b = a * c$ and a is a non-zero vector b, c may be or may not be non zero vector then:

- a. $b = c$
b. either $b=c$ or a is parallel to $b-c$

- c. a is perpendicular to b-c
- d. none

37. The value of $\lim_{n \rightarrow \infty} \left(\frac{1}{n^2} + \frac{2}{n^2} + \frac{3}{n^2} + \dots + \frac{n}{n^2} \right) =$

- a) 1/3 b) 1/4 c) 1/2 d) 1

38. If Z is a complex number then which one of the following is not true

- a) $|Z^2| = |Z|^2$ b) $Z = \bar{Z}$ c) $\bar{Z}^2 = (\bar{Z})^2$ d) $|Z|^2 = Z \bar{Z}$

39. The distance of (x, y, z) from z=0 plane

- a. a) |x| b) y c) x d) z-y

40. The system of linear equations $x+2y=3$ and $3x+6y=9$ have

- a) no solution b) unique solution c) infinite solution d) trivial solution

41. The lines represented by the homogenous equation $ax^2 + 2bxy + by^2 = 0$ are real and distinct if

- a) $h^2 = ab$ b) $h^2 > ab$ c) $h^2 < ab$ d) $a = b$

42. Two lines $ax+by+c=0$ and $ax+by+k=0$ are on opposite sides of origin if

- b. c and k are of opposite signs
- c. c and k are of same signs
- d. $c=k=0$
- e. None of these

43. The parametric equation $x=2+t^2, y=2t$ represents

- a) Circle b) Parabola c) Ellipse d) Hyperbola

44. The polar equation $r^2 \cos 2\theta = a^2$ represent

- f. a) circle b) parabola c) hyperbola d) ellipse

45. The value of $\lim_{x \rightarrow 0} \frac{e^{ax} - e^{bx}}{\sin x} =$

a. $\frac{a-b}{2}$

b. $\frac{e^{ax} - e^{bx}}{2}$

c. $(a+b)$

d. $(a-b)$

46. $\frac{d(\tan^{-1}x)}{dx} =$

a) $\frac{1}{1-x}$

b) $\frac{1}{1+x}$

c) $\frac{1}{1+x^2}$

d) $\frac{1}{1-x^2}$

47. The derivative of $2\log_e \sin x$ is

a) $\frac{1}{2} \cot x$

b) $2 \cot x$

c) $\cos x$

d) $2 \sin x$

48. The value of $\int \frac{(2x+1)}{5(x^2+x)} dx =$

g. $\frac{1}{5}(x^2 + x) + c$

h. $\frac{1}{5} \log(2x + 1) + c$

i. $\frac{1}{5} \log(x^2 + x) + c$

j. none

49. The area bounded by $y=x$, $x=0$ and $x=a$ is

k. a^2

l. $\frac{a^2}{2}$

m. $2a^2$

n. πa^2

50. There are 5 first year student, 8 second year students, and 7 third year students in a chess club. A group of 6 students will be chosen to compete in a competition. How many combinations of students are possible if the group is to consist of exactly 3 first year students?
- 5000
 - 4550
 - 4000
 - 3550

Chemistry Set 1

51. Anti-particle of electron is known as;
 a) Proton b) neutron c) positron d) antineutrino
52. Rate of reaction is directly proportional to ----- of reactants.
 a) active mass b) molecular mass c) equivalent weight d) none of the above
53. Azimuthal quantum no. (l) determines the:
 a) Shape of orbital b) Size of orbital c) no. of orbitals d) both 'a' and 'b'
54. The equilibrium constant is expressed either as K_c or K_p . In which of the following reaction, K_p and K_c will have same numerical value?
 a) $N_2 + 3 H_2O \leftrightarrow 2 NH_3$ b) $PCl_5 \leftrightarrow PCl_3 + Cl_2$
 c) $2SO_2 + O_2 \leftrightarrow 2 SO_3$ d) $N_2 + O_2 \leftrightarrow 2 NO$
55. Electron negativity order of halogen family is;
 a) $F > Cl > Br > I$ b) $F < Cl < Br > I$
 c) $Cl > F > Br > I$ d) $I > Cl > Br > F$
56. Which of the following do not form covalence bond?
 a) HNO_2 b) NH_3 c) CO_2 d) BaO
57. Oxidation state of neutral ligand is;
 a) 1 b) 2 c) 0 d) 3
58. Which of the following factor do not influence the rate of a chemical reaction?
 a) Concentration b) temperature c) Pressure d) Catalyst
59. Electrode potential is the potential difference between;
 a) Electrolyte and anode b) electrolyte and cathode
 c) Electrolyte and electrode d) None of these
60. How many coulombs of electricity is required to discharge 0.1 mole of Na^+ ?
 a) 96500 coulombs b) 96501 coulombs
 c) 96510 coulombs d) 9650 coulombs

61. Formula of Kinetic energy is;
 a) $K = 1/2 mv$ b) $K = \frac{1}{2}mv^2$
 c) $K = mv$ d) $K = mv^2$
62. Which of the following element is not found in human body?
 a) Potassium b) Nitrogen
 c) Oxygen d) Silicon
63. Which of the following is washing soda?
 a) $Na_2CO_3 \cdot 5H_2O$ b) Na_2CO_3 c) $Na_2CO_3 \cdot 10H_2O$ d) $Na_2CO_3 \cdot 3H_2O$
64. Which of the following is also called green vitriol?
 a) $Fe_2SO_4 \cdot 5H_2O$ b) $Fe_2SO_4 \cdot 7H_2O$ c) $Fe_2SO_4 \cdot 10H_2O$ d) $Fe_2SO_4 \cdot 12H_2O$
65. The salt of Na_2CO_3 is ----- in nature.
 a) acidic b) basic c) neutral d) amphoteric
66. Test of H_2SO_4 by using $BaCl_2$ gives
 a) white ppt b) black ppt c) blue ppt d) No ppt
67. Which oxide of nitrogen is used for local anaesthesia?
 a) NO b) N_2O_5 c) N_2O d) NO_2
68. Which of the following is most acidic?
 a) $HClO$ b) $HClO_4$ c) $HClO_3$ d) $HClO_2$
69. Benzene contains:
 a) 6 σ and 6 π bonds b) 6 σ and 3 π bonds
 c) 12 σ and 6 π bonds d) 12 σ and 3 π bonds
70. Malic acid exhibits;
 a) geometrical isomerism b) optical isomerism
 c) Racemic mixture d) both 'a' and 'b'
71. Electrophiles are;
 a) Lewis acid b) Lewis base c) Oxidising agent d) both 'a' and 'c'
72. Epoxy-ethane (C_2H_4O) is ----- compound.
 a) heterocyclic b) alicyclic c) aromatic d) aliphatic
73. Benzene hexachloride (BHC) is,
 a) Insecticide b) pesticide c) Herbicide d) Weedicides
74. Which of the following is not a natural polymer,
 a) starch b) proteins c) nylon d) cellulose

75. Natural rubber is a polymer of,
a) propene b)isoprene c) phenol d) formaldehyde

Physics Set 1

76. The dimensional formula of impulse is same as the dimensional formula for
a. momentum b. force
c. rate of change of momentum d. torque

77. The displacement of a body from a fixed point at any instant is given by $x=5t^2+6t+14$.

What type of motion the particle undergoes?

- a. with uniform velocity b. with uniformly accelerated Motion.
c. with non-uniformly accelerated motion d. can't be predicated

78. If the radius of the earth contracted by 2% and its mass remains the same, then weight of the body at the earth's surface ;

- a. will increase b. will decrease c. will remain the same d. none of the above

79. The movement of linear momentum is called

- a. Torque b. couple
c. impulse d. angular momentum

80. A body tied to the string is moving in a vertical circle. In what position of the body, the tension in the string is a minimum

- a. In the highest position of the body b. In the lowest position of the body
c. In the position when the string is moving in a vertical circle.
d. tension is same in all positions

81. Volume rate of flow of liquid moving with velocity v through a cross sectional area A is

- a. A/v b. $A.v^2$ c. $A.v$ d. A/v^2

82. The SI unit of poisson ratio is ;

- a. J/m b. N/m^2 c. Nm^2 d. unitless

83. Two spheres are made of same metal and have same mass. One is solid and other is hollow. When heated to the same temperature, which of the following statements is correct about percentage increase in their diameters?

- a. It will be more for hollow sphere
b. It will be more for solid sphere
c. It will be same for both spheres
d. It may be more or less depending on the ratio of the diameter of the two spheres

84. The quickest process of transmission of heat is:

- a. convection b. conduction c. radiation d. all of the above

85. Which of the following is true when a gas is allowed to expand adiabatically against an internal pressure?
- Temperature remains constant
 - Pressure remains constant
 - Internal energy decreases
 - Internal energy increases
86. The temperature of the source of Carnot engine is 0°C and that of sink is -39°C . The efficiency of heat engine is:
- 0%
 - 14.3%
 - 39%
 - none of the above
87. What is the angle between the plane of polarization and the direction of propagation of polarized light?
- 0
 - $\pi/4$
 - $\pi/2$
 - π
88. Two coherent light sources S1 and S2 ($\lambda=6000\text{\AA}$) are 1mm apart from each other. The screen is placed at a distance of 25cm from the sources. The width of the fringes on the screen should be:
- 0.015cm
 - 0.025cm
 - 0.010cm
 - 0.030cm
89. The magnifying power of a compound microscope increases when
- the focal length of the objective lens is increased and that of eye lens is decreased.
 - the focal length of eye lens is increased and that of objective lens is decreased
 - focal length of both objective and eye piece are increased
 - focal length of both objective and eye piece are decreased
90. Light travels from a medium of refractive index μ_1 to another of refractive index μ_2 ($\mu_1 > \mu_2$). For total internal reflection of light, which of the following is not true?
- Light must travel from medium of refractive index μ_1 to that of μ_2
 - Angle of incidence must be greater than the critical angle
 - Angle of refraction in second medium is 90°
 - Light must travel from the medium of refractive index μ_2 to that of μ_1
91. How is the charge shared when two charged conductors are brought in contact?
- Equally
 - In proportion of their capacitance
 - Inversely as their capacitance
 - None of the above
92. Given that $R_1=2\Omega$, $R_2=3\Omega$ and $R_3=6\Omega$ which of the following combinations will give an effective resistance of 4Ω ?
- All in parallel
 - R_1 and R_2 in parallel in series with R_3 .
 - R_3 and R_2 in parallel in series with R_1
 - R_3 and R_1 in parallel in series with R_2 .
93. Potentiometer is better than voltmeter in measuring emf of the cell because
- dial of voltmeter is smaller than potentiometer.
 - resistance of potentiometer wire is high
 - potentiometer does not draw any current from potential source
 - the sensitivity of potentiometer is more.

94. A wire is wound in the form of the solenoid of length 'l' and the diameter 'd'. When a strong current is passed through the solenoid, there is the tendency to
- keep both l and d constant.
 - decreases both l and d.
 - increase both l and d.
 - increase l but decrease d.
95. A choke is a
- capacitance with large self-inductance
 - resistor with large self-inductance
 - inductor with large self-inductance
 - inductor with a small self-inductance
96. Decibel is a unit of:
- intensity of light
 - X-ray radiation capacity
 - sound loudness
 - energy of radiation
97. When the electron jumps from the fourth orbit to the second orbit, one gets the
- second line of the Paschen series
 - second line of the Lyman series
 - second line of the Balmer series
 - first line of the Pfund series
98. When the charged oil drop moves upward in an electric field, the electric force acting in an oil drop is
- equal to the gravitational force
 - less than the gravitational force
 - greater than the mass of the oil drop
 - greater than the gravitational force
99. The impurity added in Germanium crystals to make n- type semiconductor is
- Aluminum
 - Gallium
 - Iridium
 - phosphorous
100. The half-life period of a radioactive element X is same as the mean life time of another radioactive element Y. Initially they have the same number of atoms. Then
- X and Y decay at same rate always
 - X will decay faster than Y
 - Y will decay faster than X
 - X and Y have same decay rate initially

Answer Sheet

English

1	A
2	D
3	D
4	C
5	C
6	A
7	D
8	D
9	D
10	D
11	A
12	A
13	D
14	B
15	C
16	A
17	A
18	A
19	A
20	B
21	C
22	B
23	C
24	B
25	A

Math

26	B
27	C
28	B
29	C
30	B
31	A
32	B
33	A
34	C
35	A
36	B
37	C
38	B
39	A
40	C
41	B
42	A
43	B
44	C
45	D
46	C
47	B
48	C
49	B
50	B

Chemistry

51	C
52	A
53	A
54	D
55	A
56	D
57	C
58	C
59	C
60	D
61	B
62	D
63	C
64	B
65	B
66	A
67	A
68	B
69	D
70	C
71	D
72	A
73	A
74	C
75	B

Physics

76	a
77	b
78	b
79	d
80	a
81	c
82	d
83	c
84	c
85	c
86	b
87	a
88	a
89	d
90	d
91	b
92	c
93	c
94	a
95	c
96	c
97	c
98	d
99	d
100	b