DEPARTMENT OF SCHOOL EDUCATION

Government JEE Coaching- 2019-20

UNIT TEST- 7

Time: 60min

Marks: 180

Instructions:

1) Answer all the questions

2) For Every correct answer Four marks will be given

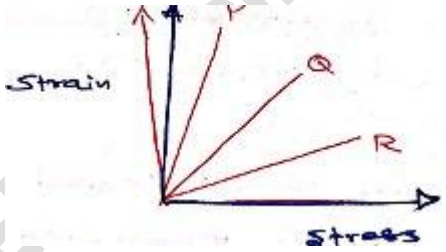
3) For Every wrong answer One mark will be deducted

CHOOSE THE CORRECT ANSWER **45x4=180**

1. There are two wires of same material and same length while the diameter of second wire is 2 times the diameter of second wire is 2 times the diameter of first wire, then ratio of extension produced in the wires by applying same load will be

   1) 1:1 2) 2:1 3) 1:2 4) 4:1

2. The strain stress curves of three wires of different materials are shown in the figure. P, Q and R are the elastic limits of the wires. The figure shows that



   1)Elasticity of wire P is maximum 2)Elasticity of wire Q is maximum

   3) Teusile strength of R is maximum 4) None of the above is true

3. A force F is needed to break a copper wire having radius R. The force needed to break a copper wire of same length and radius 2R will be

   1) $\frac{F}{2}$ 2) F 3) 4F 4) $\frac{F}{4}$

4. A sample of a liquid has an initial volume of 1.5L. The volume is reduced by 0.2 ml. The pressure increases by 140 KPa. What is the bulk modulus of the liquid?

   1) $\frac{F}{2}$ 2) F 3) 4F 4) $\frac{F}{4}$

5. A uniform cube is subjected to volume compression. If each side is decreased by 1% then bulk strain is

   1) 0.01 2) 0.06 3) 0.02 4) 0.03

6. The compressibility of a material is

1)Product of volume and its pressure

2) The change in pressure per unit always in volume strain

3) The fractional change in volume per unit change in pressure

4) None of the above

7. Force of 100N each are applied in opposite direction on the upper and lower forces of a cube of side 20cm. The upper face is shifted parallel to itself by 0.25cm. If the side of the cube were 10cm, then the displacement would be

1) 0.25 cm 2) 0.5 cm 3) 0.75 cm 4) 1 cm

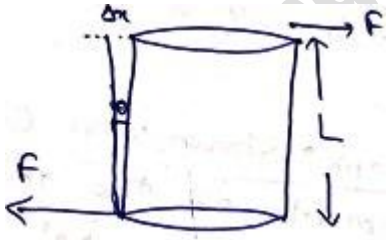
8. Two wires of same diameter of the same material having the length l and 2l. If the force F is applied on each, the ratio of the work done is the two wires will be

1) 1:2 2) 1:4 3) 2:1 4) 1:1

9. When an elastic material with young's modulus 'y' is subjected to stretching stress 's' elastic energy per unit volume of the material is

1) $\frac{YS}{2}$ 2) $\frac{S^2Y}{2}$ 3) $\frac{S^2}{2Y}$ 4) $\frac{S}{2Y}$

10. If two equal and opposite deforming forces are applied parallel to the cross–sectional area of the cylinder as shown in the figure, there is a relative displacement between the opposite faces of the cylinder. The ratio of Δx to L is known as

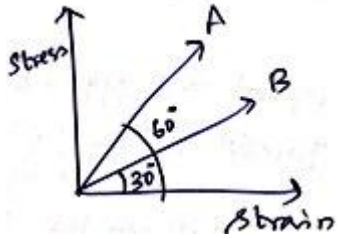


1)Longitudinal strain 2)Volumetric strain 3) Shearing strain 4) Poisson's ratio

11. Bulk modulus of water is 2×10^5 N/m^2. The change in pressure required to increase density of water by 0.1% is

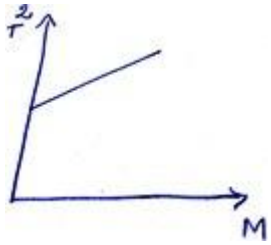
1) 2 N/m^2 2) 2×10^8 N/m^2 3) 2×10^6 N/m^2 4) 2×10^4 N/m^2

12. The stress Versus strain graphs for wires two materials 'A' and 'B' are as shown in figure. If Y_A and Y_B are the young's modulii of the materials, then



1) $Y_B = 2Y_A$ 2) $Y_A = Y_B$ 3) $Y_B = 3Y_A$ 4) $Y_A = 3Y_B$

13. The graph shown was obtained from experimental measurements of the period of oscillations 'T' for different masses 'M' placed in the scale pan on the lower end of the spring balance. The most likely reason for the line not passing through the origin is that the



1)Spring did not obey Hooke's law 2) amplitude of the Oscillations was toolarge
3) clock used needed regulating 4) mass of the pan was neglected

14. A work of 2×10^{-2} J is done on a wire of length 50cm and area of cross–section 0.5 mm^2 .If the young's modulous of the material of the wire is 2×10^{10} N/m^2 then the wire must be
1)elongated to 50.1414 cm 2) contracted by 2.0 mm
3) stretched by 0.707mm 4) none of these

15. A wire elongates by 'l' mm when a load'w'is hanged from it. If the wire goes over a pulley and two weights 'W' each are hung at the two ends, the elongation of wire will be (mm)
1) $\frac{l}{2}$ 2) ℓ 3) 2ℓ 4) zero

16. Which one the following can not be prepared by WURTZ reaction
1) CH_4 2) C_2H_6 3) C_3H_8 4) C_4H_{10}

17. The reactivity of hydrogen atom attached to carbon atom in the halogenation of alkane has the order
1) $3^\circ > 1^\circ > 2^\circ$ 2) $2^\circ > 1^\circ > 3^\circ$ 3) $3^\circ > 2^\circ > 1^\circ$ 4) $1^\circ > 2^\circ > 3^\circ$

18. The molecules having dipole moments are
1)2,2 dimethy propane 2) trans–pent–2–ene
3)cis–hex–2–ene 4) Both b & c

19. The number of benzylic hydrogen atoms in ethyl benzene is
1) 3 2) 5 3) 2 4) 7

20. Which of the compounds is not aromatic ?
1) 2) 3) 4)

21. Which of the following reaction is not shown by benzene
1) addition 2) oxidation 3) side chain substitution 4) π complexformation

22. Nitration of benzene is

1)nucleophilic substitution 2) nucleophilic addition

3) electrophilic substitution 4) electrophilic addition

23. Which one of the following does not give an alkane ?

1)Electrolysis of concentrated sodium acetate solution

2) Reaction of sodium acetate with soda lime

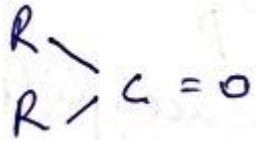
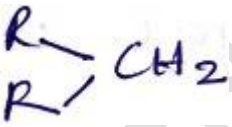
3) Reaction of CH_3I with Na in ether

4) Reaction of ethyl chloride with alcoholic KOH

24. Cyclohexane a hydrocarbon floats on water because

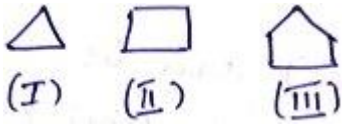
1) it is immiscible & lighter than water 2) it's density is low compared to water

3) it's a non polarsubstance 4) both (1) & (2)

25.  is not converted to  by

1)Wolffkishner reaction 2) Clemmensen reduction

3) red P + HI at 200°c 4) WURTZ reaction

26.  the correct order of reactinty towards addition reaction is

1) I >III >II 2) I > II > III 3) III > II > I 4) III> I > II

27. A compound A on ozyonolysis gives $CH_3CO\,CH_3$ and HCHO. The IUPAC name of the compound is

1)2 methyl propane 2) 2– methyl propane 3)1– methyl propene 4) 2 methyl propyne

28. One mole of symmetrical alkene on ozonolysis gives 2 moles of aldehyde having a molecular mass of 44u. The alkene is

1)ethene 2) propene 3)1– butene 4) 2– butene

29. Propyne is formed by reaction of

1) CH_3Br with sodium acetylide 2) CH_3I with disodium acetylide

3) CH_3I with acetone 4) CH_3I with chloroethylene

30. Benzyl chloride ($C_6H_5CH_2Cl$) can be prepared from toluene by chloroethylene with

I – SO_2Cl_2 II– $SOCl_2$ III – Cl_2 IV– NaOCl

1) I & III 2) I &IV 3) II & III 4) IV

31. The term independent of x in $\left(2x^2 - \frac{3}{x^3}\right)^{15}$ is

1) $\frac{9}{64}$ 2) $\frac{8}{45}$ 3) $\frac{64}{45}$ 4) $\frac{45}{64}$

32. 5^{th} term of $\left(\sqrt{x}+\frac{a}{x}\right)^{12}$ is independent of x and it is 1980. Then a =

1) 2 2) $\sqrt{2}$ 3) $\pm\sqrt{2}$ 4) ± 2

33. If the third term in the binomial expression if $(1+x)^m$ is $-\frac{1}{8}x^2$, then the rational value of m is

1) 2 2) $\frac{1}{2}$ 3) 3 4) 4

34. If the third term is the expansion of $\left(\frac{1}{x}+x\log_{10}x\right)^5$ is 1 then x =

1) 1 2) 10 3) 100 4) $\frac{1}{\sqrt{10}}$

35. The co efficient of x^3 in $\left[\sqrt{x^5}+\frac{3}{\sqrt{x^3}}\right]^6$ is

1) 0 2) 120 3) 420 4) 540

36. The coefficient of x^n is $(1+x)^n.(1+\frac{1}{x})^n$ is

1) 0 2) 1 3) 2^n 4) $2nc_n$

37. The number of integral terms in the expansion of $\left(\sqrt{3}+\sqrt[8]{5}\right)^{256}$ is

1) 33 2) 34 3) 35 4) 32

38. In the binomial expansion of $(a-b)^n$, $n\geq 5$, the sum of 5^{th} and 6^{th} terms is zero, then $\frac{a}{b}$ =

1) $\frac{5}{n-4}$ 2) $\frac{6}{n-5}$ 3) $\frac{n-5}{6}$ 4) $\frac{n-4}{5}$

39. If the coefficient of x^7 and x^8 is $\left(2+\frac{x}{3}\right)^n$ are equal, then n =

1) 45 2) 55 3) 35 4) 27

40. If the coefficient of r^{th}, $(r+1)^{th}$ and $(r+2)^{th}$ terms in the binomial expansion of $(1+y)^m$ are in A.P, then m & r satisfy the equation

1) $m^2-m(4r-1)+4r^2-2=0$ 2) $m^2-m(4r+1)+4r^2+2=0$

3) $m^2-m(4r+1)+4r^2-2=0$ 4) $m^2-m(4r-1)+4r^2+2=0$

41. If 28, 56, 70 are the successive coefficient of $(1+x)^n$, then n =

1) 8 2) 9 3) 10 4) 11

42. The middle term in the expansion of $\left(x+\frac{1}{x}\right)^{10}$ is

1) $10c_6$ 2) $-10c_6$ 3) $-10c_5$ 4) $10c_5$

43. The numerically greatest termof $(3x+2xy)^{11}$ when x = 2/3, y = ¾ is

1) $10c_5$ X 486 2) $-10c_5$ X 486 3) $11c_5$ X 486 4) $-11c_5$ X 486

44. If $(1+x)^n = C_0C_1x+C_2x^2+----+C_nx^n$ then $Co+2C_1+3C_2+----+(n+1)C_n$ =

1) 2^n+n2^{n-1} 2) $2^{n-1}+n2^n$ 3) $2^n+(n+1)2^n$ 4) $2^{n-1}+(n-1)2^n$

45. If C_0, C_1, C_2 ..... are the bionomical coefficient in the expansion of $(1+x)^n$ then $C_0+C_2+C_4+C_8$ =

1) 2^7 2) 256 3) 2^9 4) 258

ANSWER KEY

1	4	16	1	31	4
2	4	17	3	32	3
3	3	18	4	33	2
4	1	19	3	34	2
5	4	20	2	35	4
6	3	21	1	36	2
7	2	22	3	37	1
8	1	23	4	38	4
9	3	24	4	39	2
10	3	25	4	40	3
11	3	26	2	41	1
12	4	27	2	42	4
13	4	28	4	43	3
14	1	29	1	44	1
15	2	30	1	45	2