

S.B. Roll No. _____

APPLIED PHYSICS
1st Exam/Common/5403/0351/Dec'11



Duration : 2½ Hrs.

M. Marks: 75

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| <p>1. Dimensions of impulse are
a. $[ML^{-1}T^{-2}]$ b. $[MT^{-2}]$
c. $[MLT^{-1}]$ d. $[ML^{-1}T^{-3}]$</p> <p>2. Which of the following has the smallest value?
a. fermi b. millimeter
c. angstrom d. micron</p> <p>3. The radius of a sphere is 5cm. Its volume will be given by
a. $523.33cm^3$ b. $5.0 \times 10^2 cm^3$
c. $5.23 \times 10^2 cm^3$ d. $5 \times 10^2 cm^3$</p> <p>4. The error in the measurement of radius of sphere is 0.3%. What is percentage error in measurement of its volume?
a. 0.3% b. 0.9%
c. 0.6% d. $4/3\pi(0.3)^3$</p> <p>5. An experiment measures quantities a,b,c and X is calculated from the formula $X=ab^2/c^3$
The percentage errors in a,b,c are $\pm 1\%$, $\pm 3\%$ and $\pm 2\%$ respectively. The percentage error in x can be
a. $\pm 13\%$ b. $\pm 4\%$
c. $\pm 7\%$ d. $\pm 1\%$</p> <p>6. If $f=x^2$, then the relative error in f is
a. $\Delta x/x$ b. $(\Delta x)^2/x$
c. $(\Delta x)^2$ d. $2\Delta x/x$</p> <p>7. The density of the material of a cube is measured by measuring its mass and lengths of its sides. if the maximum errors in the measurement of mass and the length are 3% and 2% respectively, the maximum error in the measurement of density is
a. 1% b. 9%
c. 5% d. 7%</p> <p>8. The significant figures in 0.009 is
a. 1 b. 3
c. 2 d. 4</p> <p>9. The velocity 'v' of a particle is given in terms of time 't' as
$v = at + \frac{b}{b+c}$
The dimensions of a,b,c are
a. $[L^2][T][LT^{-2}]$ b. $[LT^2][L][T]$
c. $[LT^2][LT][L]$ d. $[L][LT][T^2]$</p> <p>10. The dimensions of quantities in one or more pairs of the following are same. Identify the pair
a. torque and force</p> | <p>b. angular momentum and work
c. energy and Young's modulus
d. light year and wave length</p> <p>11. Checking the correctness of equation using the method of dimensions is based on
a. equality of inertial frames of reference
b. the types of system of units
c. principle of homogeneity of dimensions
d. none of these</p> <p>12. $[ML^2T^{-2}]$ represents
a. force b. pressure
c. work
d. Planck's constant</p> <p>13. Which of the following quantities is a scalar?
a. mass b. velocity
c. momentum d. displacement</p> <p>14. The minimum number of vectors of unequal magnitude required to produce zero resultant is
a. 2 b. 3
c. 4 d. more than 4</p> <p>15. Two vectors \vec{A} and \vec{B} obey the relation $\vec{A} + \vec{B} = \vec{A} - \vec{B}$ and θ is angle between them, then
a. $\theta = 120^\circ$ b. $\vec{B} = 0$
c. $\theta = 90^\circ$ d. $\vec{A} = 0$</p> <p>16. Two vectors \vec{A} and \vec{B} are $\vec{A} = 2\hat{i} + 5\hat{k}$ and $\vec{B} = 3\hat{j} + 4\hat{k}$ their scalar product is
a. 20 b. $5\sqrt{33}$
c. 23 d. 26</p> <p>17. The condition of vectors \vec{A} and \vec{B} to be perpendicular is
a. $\vec{A} \cdot \vec{B} = 1$ b. $\vec{A} \times \vec{B} = 0$
c. $\vec{A} \cdot \vec{B} = 0$ d. $\vec{A} \times \vec{B} = 1$</p> <p>18. Given $\vec{A} = 5\hat{i} + 7\hat{j} - 3\hat{k}$ and $\vec{B} = 2\hat{i} + 2\hat{j} - m\hat{k}$. If \vec{A} and \vec{B} are perpendicular vectors, then value of m is
a. -2 b. -7
c. 8 d. -8</p> | <p>19. A vehicle is moving with a uniform speed 'v' on a curved road of width 'b' and radius of curvature 'R'. For providing the centripetal force to the vehicle, the angle of elevation required between the outer and inner edges of the road is
a. $\tan \theta = \frac{v^2}{Rg}$
b. $\tan \theta = \frac{v}{Rg^2}$
c. $\tan \theta = \frac{v}{Rg}$
d. $\tan \theta = \frac{v}{R^2g}$</p> <p>20. Two cars of masses M_1 and M_2 are revolving with same speed on circular paths of radii r_1 and r_2 respectively. The ratio of their centripetal accelerations will be
a. $\frac{r_1}{r_2}$ b. $\frac{r_2}{r_1}$
c. $\left(\frac{r_2}{r_1}\right)^{1/2}$ d. $\left(\frac{r_1}{r_2}\right)^2$</p> <p>21. Newton's second law of motion connects
a. momentum and acceleration
b. change of momentum and velocity
c. rate of change of momentum and external force
d. rate of change of force and momentum</p> <p>22. A particle is moving with a constant speed along a straight-line path. A force is not required to
a. increase its speed
b. decrease its momentum
c. change its direction
d. keep it moving with the same speed</p> <p>23. Action and reaction forces do not balance each other because they
a. act on the same body
b. do not act on the same body
c. are in opposite directions
d. are not equal</p> |
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| <p>24. An athlete runs some distance before taking a long jump so that he may</p> <ol style="list-style-type: none"> acquire large inertia of motion overcome inertia of rest get inertia of direction acquired Kinetic energy <p>25. A machine gun fires a bullet of mass 40gm with velocity 1200ms^{-1}. The person holding it can apply a maximum force of 144 Newton on the gun. The maximum number of bullets that can be fired per second in</p> <ol style="list-style-type: none"> 3 4 5 7 <p>26. A force of 5N acts on a body of weight 9.8N. What is the acceleration produced in M/s^2.</p> <ol style="list-style-type: none"> 49.0 1.96 5.0 0.51 <p>27. The limiting friction between two bodies in contact independent of</p> <ol style="list-style-type: none"> nature of surfaces in contact the area of surfaces in contact normal reaction between the surfaces all of the above <p>28. The Kinetic friction is always</p> <ol style="list-style-type: none"> less than rolling friction equal to rolling friction greater than rolling friction may be less than, greater or equal to rolling friction <p>29. A force of 98N is required to pull a body of mass 100Kg over ice. The coefficient of friction is</p> <ol style="list-style-type: none"> 0.1 0.8 0.98 cannot be determined <p>30. The energy stored in a watch spring is</p> <ol style="list-style-type: none"> Kinetic energy potential energy heat energy chemical energy <p>31. A motor boat is travelling with a speed of 30ms^{-1}. If the force on it due to water flow is 500N, the power of the boat is</p> <ol style="list-style-type: none"> 150KW 1.5KW 15KW 150W <p>32. Nms^{-1} is the unit of</p> <ol style="list-style-type: none"> impulse power energy work <p>33. When the force retards the motion of a body the work done is</p> | <ol style="list-style-type: none"> zero negative positive +ve or -ve depending upon situation <p>34. If the momentum of a body is doubled, the Kinetic energy is</p> <ol style="list-style-type: none"> halved unchanged doubled increased four time <p>35. A body falling from a height of 10m rebounds from the floor. If it loses 2% of energy in the impact, how high will it rebound?</p> <ol style="list-style-type: none"> 10m 8m 12m none of the above <p>36. A uniform force of 4N acts on a body of mass 8Kg for a distance of 2.0m. The K.E. required by the body is</p> <ol style="list-style-type: none"> 8J 64J 4J 16J <p>37. A force \vec{F} acting on a body moving in a circle of radius r is always perpendicular to the instantaneous velocity \vec{v}. The work done by the force on the body in one complete revolution is</p> <ol style="list-style-type: none"> Fv Fr $F2\pi r$ 0 <p>38. Watt day is the unit of</p> <ol style="list-style-type: none"> power energy force none <p>39. A hollow sphere and a solid sphere of same mass and radius are allowed to roll down an inclined plane from same height simultaneously. Which will reach the bottom first</p> <ol style="list-style-type: none"> hollow sphere solid sphere both together none of the above <p>40. Mass in linear motion has its analog in rotational motion</p> <ol style="list-style-type: none"> moment of inertia angular momentum torque weight <p>41. Weight of force is called</p> <ol style="list-style-type: none"> torque weight moment of inertia angular momentum <p>42. Moment of inertia is independent of</p> <ol style="list-style-type: none"> mass of the body shape of the body | <ol style="list-style-type: none"> location of axis of rotation torque on the body <p>43. If earth shrinks suddenly to half of its present radius without change in mass, the duration of the day will be</p> <ol style="list-style-type: none"> 24 hours 6 hours 96 hours 12 hours <p>44. A boy suddenly comes and sits on a circular rotating table. What will remain conserved?</p> <ol style="list-style-type: none"> linear momentum Kinetic energy angular momentum none of these <p>45. When the spring is loaded, the strain produced is</p> <ol style="list-style-type: none"> longitudinal volumetric shearing none <p>46. The property of metals which allows them to be drawn into thin wires beyond their elastic limit without rupture is called</p> <ol style="list-style-type: none"> ductility elasticity malleability hardness <p>47. In steel the Young's modulus and the strain at the breaking point are $2 \times 10^{11} \text{Nm}^{-2}$ and 0.15 respectively. The stress at the breaking point for steels is therefore</p> <ol style="list-style-type: none"> $1.33 \times 10^{11} \text{Nm}^{-2}$ $7.5 \times 10^{-3} \text{Nm}^{-2}$ $1.33 \times 10^{12} \text{Nm}^{-2}$ $3 \times 10^{10} \text{Nm}^{-2}$ <p>48. If the temperature of a liquid is raised, then its surface tension is</p> <ol style="list-style-type: none"> decreased increased irregular equal to viscosity <p>49. Due to capillary action a liquid will fall in a tube, if the angles of contact is</p> <ol style="list-style-type: none"> acute obtuse 90° zero <p>50. The CGS unit of coefficient of viscosity is</p> <ol style="list-style-type: none"> poise newton $\text{Kg-m}^{-1}\text{s}^{-1}$ gs/cm^{-1} <p>51. The clouds float in atmosphere because of</p> <ol style="list-style-type: none"> their low temperature their low viscosity their low density creation of low pressure |
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52. Unit of modulus of elasticity is a. dyne/cm b. dyne/cm ² c. dyne-cm d. dynes	c. remains unchanged d. first decreases and then increases	68. A piece of ice at 0°C is put into a vessel containing water at 0°C. The ice will a. melt b. slightly melt c. not melt d. vanish in no time
53. The meniscus of mercury in a capillary tube is a. convex b. concave c. plane d. uncertain	61. Mercury thermometers can be used to measure temperature upto a. 100°C b. 212°C c. 500°C d. 360°C	69. Two bodies are said to be in thermal equilibrium if they have the same a. temperature b. amounts of heat c. specific heat d. thermal capacities
54. Hooke's law essentially defines a. stress b. strain c. field point d. elastic limit	62. If a bimetallic strip is heated it will a. twist itself into a helix b. not bend at all c. bend towards the metal with lower thermal expansion coefficient d. bend towards the metal with higher thermal expansion coefficient	70. The transmission by conduction is most prominent in a. liquids b. solids c. gases d. liquids and gases
55. Which one of the following quantities does not have the unit of force per unit area a. stress b. strain c. Young's modulus of elasticity d. pressure	63. The process by which sun's rays reach the earth is a. radiation b. conduction c. convection d. diffusion	71. A person of mass 60kg climbs up 20m long staircase to the top of a building 10m high. If $g=10\text{ms}^{-2}$ what is the work done by him? a. 3KJ b. 6KJ c. 12KJ d. 24KJ
56. Water is flowing through a tube of non-uniform cross-section. If the ratio of the radius of the tube at the entrance and exit is 3:2 then the ratio of velocity of liquid entering and leaving the tube is a. 8:27 b. 4:9 c. 1:1 d. 9:4	64. The velocity of heat radiation in vacuum is a. equal to that of light b. less than that of light c. greater than that of light d. equal to that of sound	72. A body measures 8N in air and 5N in water. The buoyant force is a. 3N b. 13N c. 8N d. 5N
57. Soap helps in better cleaning of clothes because a. it reduces the surface tension of solution b. it gives strength of solution c. it absorbs the dirt d. chemical of soaps change	65. By increasing the temperature of a liquid is a. volume and density decrease b. volume and density increase c. volume increases and density decreases d. volume decreases and density increases	73. A body floats in a liquid contained in a beaker. The whole system is falling under gravity, the upthrust on the body due to liquid is a. zero b. equal to weight of body in air c. equal to weight of liquid displaced d. equal to weight of impressed part of the body
58. The temperature of a gas is a measure of a. the average Kinetic energy of gaseous molecules b. the average potential energy of gaseous modulus c. the average distance between the molecules of the gas d. the size of the molecules of the gas	66. In Searle's method for finding conductivity of metals, the temperature gradient along the bar a. is greater near the hot end b. is greater near the cold end c. is same at all points along the bar d. increases as we go from hot end to cold end	74. The minimum resultant of two forces 4N and 3N is a. 7N b. 4N c. 3N d. 1N
59. The temperature of a patient is 40°C, his temperature of Fahrenheit scale will be a. 104°F b. 72°F c. 96°F d. 100°F	67. The thermometer suitable to measure 2000°C is a. gas thermometer b. mercury thermometer c. vapour-pressure thermometer d. total radiation pyrometer	75. If $\vec{F} = 8\hat{i} - 2\hat{j}$ and $\vec{r} = 6\hat{i} + 8\hat{k}$ then $\vec{F} \cdot \vec{r}$ will be a. 6 units b. 8 units c. 32 units d. 48 units
60. When water is heated from 0°C to 100°C its volume a. increases b. decreases		

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b. change of momentum and velocity
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a. mass of the body
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| 7. The limiting friction between two bodies in contact independent of
a. nature of surfaces in contact
b. the area of surfaces in contact
c. normal reaction between the surfaces
d. all of the above | 14. If the momentum of a body is doubled, the Kinetic energy is
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71. Two vectors \vec{A} and \vec{B} are $\vec{A} = 2\hat{i} + 5\hat{k}$ and $\vec{B} = 3\hat{j} + 4\hat{k}$ their scalar product is
a. 20 b. $5\sqrt{33}$
c. 23 d. 26
72. The condition of vectors \vec{A} and \vec{B} to be perpendicular is
a. $\vec{A} \cdot \vec{B} = 1$
b. $\vec{A} \times \vec{B} = 0$
c. $\vec{A} \cdot \vec{B} = 0$
d. $\vec{A} \times \vec{B} = 1$
73. Given $\vec{A} = 5\hat{i} + 7\hat{j} - 3\hat{k}$ and $\vec{B} = 2\hat{i} + 2\hat{j} - m\hat{k}$. If \vec{A} and \vec{B} are perpendicular vectors, then value of m is
a. -2 b. -7
c. 8 d. -8
74. A vehicle is moving with a uniform speed 'v' on a curved road of width 'b' and radius of curvature 'R'. For providing the centripetal force to the vehicle, the angle of elevation required between the outer and inner edges of the road is
a. $\tan \theta = \frac{v^2}{Rg}$
b. $\tan \theta = \frac{v}{Rg^2}$
c. $\tan \theta = \frac{v}{Rg}$
d. $\tan \theta = \frac{v}{R^2g}$
75. Two cars of masses M_1 and M_2 are revolving with same speed on circular paths of radii r_1 and r_2 respectively. The ratio of their centripetal accelerations will be
a. $\frac{r_1}{r_2}$ b. $\frac{r_2}{r_1}$
c. $\left(\frac{r_2}{r_1}\right)^{1/2}$ d. $\left(\frac{r_1}{r_2}\right)^2$

S.B. Roll No. _____

APPLIED PHYSICS
1st Exam/Common/5403/0351/Dec' 11



M. Marks: 75

Duration : 2½ Hrs.

- | | | |
|---|---|--|
| 1. Weight of force is called
a. torque b. weight
c. moment of inertia
d. angular momentum | 10. The CGS unit of coefficient of viscosity is
a. poise b. newton
c. $\text{Kg-m}^{-1}\text{s}^{-1}$ d. gs/cm^{-1} | d. the size of the molecules of the gas |
| 2. Moment of inertia is independent of
a. mass of the body
b. shape of the body
c. location of axis of rotation
d. torque on the body | 11. The clouds float in atmosphere because of
a. their low temperature
b. their low viscosity
c. their low density
d. creation of low pressure | 19. The temperature of a patient is 40°C , his temperature of Fahrenheit scale will be
a. 104°F b. 72°F
c. 96°F d. 100°F |
| 3. If earth shrinks suddenly to half of its present radius without change in mass, the duration of the day will be
a. 24 hours b. 6 hours
c. 96 hours d. 12 hours | 12. Unit of modulus of elasticity is
a. dyne/cm b. dyne/cm^2
c. dyne-cm d. dynes | 20. When water is heated from 0°C to 100°C its volume
a. increases
b. decreases
c. remains unchanged
d. first decreases and then increases |
| 4. A boy suddenly comes and sits on a circular rotating table. What will remain conserved?
a. linear momentum
b. Kinetic energy
c. angular momentum
d. none of these | 13. The meniscus of mercury in a capillary tube is
a. convex b. concave
c. plane d. uncertain | 21. Mercury thermometers can be used to measure temperature upto
a. 100°C
b. 212°C
c. 500°C
d. 360°C |
| 5. When the spring is loaded, the strain produced is
a. longitudinal b. volumetric
c. shearing d. none | 14. Hooke's law essentially defines
a. stress b. strain
c. field point d. elastic limit | 22. If a bimetallic strip is heated it will
a. twist itself into a helix
b. not bend at all
c. bend towards the metal with lower thermal expansion coefficient
d. bend towards the metal with higher thermal expansion coefficient |
| 6. The property of metals which allows them to be drawn into thin wires beyond their elastic limit without rupture is called
a. ductibility b. elasticity
c. malleability d. hardness | 15. Which one of the following quantities does not have the unit of force per unit area
a. stress
b. strain
c. Young's modulus of elasticity
d. pressure | 23. The process by which sun's rays reach the earth is
a. radiation
b. conduction
c. convection
d. diffusion |
| 7. In steel the Young's modulus and the strain at the breaking point are $2 \times 10^{11} \text{ Nm}^{-2}$ and 0.15 respectively. The stress at the breaking point for steels is therefore
a. $1.33 \times 10^{11} \text{ NM}^{-2}$
b. $7.5 \times 10^{-3} \text{ Nm}^{-2}$
c. $1.33 \times 10^{12} \text{ Nm}^{-2}$
d. $3 \times 10^{10} \text{ Nm}^{-2}$ | 16. Water is flowing through a tube of non-uniform cross-section. If the ratio of the radius of the tube at the entrance and exit is 3:2 then the ratio of velocity of liquid entering and leaving the tube is
a. 8:27 b. 4:9
c. 1:1 d. 9:4 | 24. The velocity of heat radiation in vacuum is
a. equal to that of light
b. less than that of light
c. greater than that of light
d. equal to that of sound |
| 8. If the temperature of a liquid is raised, then its surface tension is
a. decreased
b. increased
c. irregular
d. equal to viscosity | 17. Soap helps in better cleaning of clothes because
a. it reduces the surface tension of solution
b. it gives strength of solution
c. it absorbs the dirt
d. chemical of soaps change | 25. By increasing the temperature of a liquid is
a. volume and density decrease
b. volume and density increase
c. volume increases and density decreases
d. volume decreases and density increases |
| 9. Due to capillary action a liquid will fall in a tube, if the angles of contact is
a. acute b. obtuse
c. 90° d. zero | 18. The temperature of a gas is a measure of
a. the average Kinetic energy of gaseous molecules
b. the average potential energy of gaseous modulus
c. the average distance between the molecules of the gas | |

26. In Searle's method for finding conductivity of metals, the temperature gradient along the bar
- is greater near the hot end
 - is greater near the cold end
 - is same at all points along the bar
 - increases as we go from hot end to cold end
27. The thermometer suitable to measure 2000°C is
- gas thermometer
 - mercury thermometer
 - vapour-pressure thermometer
 - total radiation pyrometer
28. A piece of ice at 0°C is put into a vessel containing water at 0°C. The ice will
- melt
 - slightly melt
 - not melt
 - vanish in no time
29. Two bodies are said to be in thermal equilibrium if they have the same
- temperature
 - amounts of heat
 - specific heat
 - thermal capacities
30. The transmission by conduction is most prominent in
- liquids
 - solids
 - gases
 - liquids and gases
31. A person of mass 60kg climbs up 20m long staircase to the top of a building 10m high. If $g=10\text{ms}^{-2}$ what is the work done by him?
- 3KJ
 - 6KJ
 - 12KJ
 - 24KJ
32. A body measures 8N in air and 5N in water. The buoyant force is
- 3N
 - 13N
 - 8N
 - 5N
33. A body floats in a liquid contained in a beaker. The whole system is falling under gravity, the upthrust on the body due to liquid is
- zero
 - equal to weight of body in air
 - equal to weight of liquid displaced
 - equal to weight of impressed part of the body
34. The minimum resultant of two forces 4N and 3N is
- 7N
 - 4N
 - 3N
 - 1N
35. If $\vec{F} = 8\hat{i} - 2\hat{j}$ and $\vec{r} = 6\hat{i} + 8\hat{k}$ then $\vec{F} \cdot \vec{r}$ will be
- 6 units
 - 8 units
 - 32 units
 - 48 units
36. Dimensions of impulse are
- $[\text{ML}^{-1}\text{T}^{-2}]$
 - $[\text{MT}^{-2}]$
 - $[\text{MLT}^{-1}]$
 - $[\text{ML}^{-1}\text{T}^{-3}]$
37. Which of the following has the smallest value?
- fermi
 - millimeter
 - angstrom
 - micron
38. The radius of a sphere is 5cm. Its volume will be given by
- 523.33cm^3
 - $5.0 \times 10^2 \text{cm}^3$
 - $5.23 \times 10^2 \text{cm}^3$
 - $5 \times 10^2 \text{cm}^3$
39. The error in the measurement of radius of sphere is 0.3%. What is percentage error in measurement of its volume?
- 0.3%
 - 0.9%
 - 0.6%
 - $4/3\pi(0.3)^3$
40. An experiment measures quantities a,b,c and X is calculated from the formula $X=ab^2/c^3$. The percentage errors in a,b,c are $\pm 1\%$, $\pm 3\%$ and $\pm 2\%$ respectively. The percentage error in x can be
- $\pm 13\%$
 - $\pm 4\%$
 - $\pm 7\%$
 - $\pm 1\%$
41. If $f=x^2$, then the relative error in f is
- $\Delta x/x$
 - $(\Delta x)^2/x$
 - $(\Delta x)^2$
 - $2\Delta x/x$
42. The density of the material of a cube is measured by measuring its mass and lengths of its sides. if the maximum errors in the measurement of mass and the length are 3% and 2% respectively, the maximum error in the measurement of density is
- 1%
 - 9%
 - 5%
 - 7%
43. The significant figures in 0.009 is
- 1
 - 3
 - 2
 - 4
44. The velocity 'v' of a particle is given in terms of time 't' as
- $$v = at + \frac{b}{b+c}$$
- The dimensions of a,b,c are
- $[\text{L}^2][\text{T}][\text{L}^{-2}]$
 - $[\text{LT}^{-2}][\text{L}][\text{T}]$
 - $[\text{LT}^{-2}][\text{L}][\text{L}]$
 - $[\text{L}][\text{L}][\text{T}^2]$
45. The dimensions of quantities in one or more pairs of the following are same. Identify the pair
- torque and force
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 - energy and Young's modulus
 - light year and wave length
46. Checking the correctness of equation using the method of dimensions is based on
- equality of inertial frames of reference
 - the types of system of units
 - principle of homogeneity of dimensions
 - none of these
47. $[\text{M}^1\text{L}^2\text{T}^{-2}]$ represents
- force
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 - work
 - Planck's constant
48. Which of the following quantities is a scalar?
- mass
 - velocity
 - momentum
 - displacement
49. The minimum number of vectors of unequal magnitude required to produce zero resultant is
- 2
 - 3
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 - more than 4
50. Two vectors \vec{A} and \vec{B} obey the relation $\vec{A} + \vec{B} = \vec{A} - \vec{B}$ and θ is angle between them, then
- $\theta = 120^\circ$
 - $\vec{B} = 0$
 - $\theta = 90^\circ$
 - $\vec{A} = 0$
51. Two vectors \vec{A} and \vec{B} are $\vec{A} = 2\hat{i} + 5\hat{k}$ and $\vec{B} = 3\hat{j} + 4\hat{k}$ their scalar product is
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 - $5\sqrt{33}$
 - 23
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52. The condition of vectors \vec{A} and \vec{B} to be perpendicular is
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 - $\vec{A} \times \vec{B} = 0$
 - $\vec{A} \cdot \vec{B} = 0$
 - $\vec{A} \times \vec{B} = 1$

53. Given $\vec{A} = 5\hat{i} + 7\hat{j} - 3\hat{k}$ and $\vec{B} = 2\hat{i} + 2\hat{j} - m\hat{k}$. If \vec{A} and \vec{B} are perpendicular vectors, then value of m is
- 2
 - 7
 - 8
 - 8
54. A vehicle is moving with a uniform speed 'v' on a curved road of width 'b' and radius of curvature 'R'. For providing the centripetal force to the vehicle, the angle of elevation required between the outer and inner edges of the road is
- $\tan\theta = \frac{v^2}{Rg}$
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55. Two cars of masses M_1 and M_2 are revolving with same speed on circular paths of radii r_1 and r_2 respectively. The ratio of their centripetal accelerations will be
- $\frac{r_1}{r_2}$
 - $\frac{r_2}{r_1}$
 - $\left(\frac{r_2}{r_1}\right)^{1/2}$
 - $\left(\frac{r_1}{r_2}\right)^2$
56. Newton's second law of motion connects
- momentum and acceleration
 - change of momentum and velocity
 - rate of change of momentum and external force
 - rate of change of force and momentum
57. A particle is moving with a constant speed along a straight-line path. A force is not required to
- increase its speed
 - decrease its momentum
 - change its direction
 - keep it moving with the same speed
58. Action and reaction forces do not balance each other because they
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 - do not act on the same body
 - are in opposite directions
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60. A machine gun fires a bullet of mass 40gm with velocity 1200ms^{-1} . The person holding it can apply a maximum force of 144 Newton on the gun. The maximum number of bullets that can be fired per second in
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61. A force of 5N acts on a body of weight 9.8N. What is the acceleration produced in M/s^2 .
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62. The limiting friction between two bodies in contact independent of
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 - the area of surfaces in contact
 - normal reaction between the surfaces
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63. The Kinetic friction is always
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64. A force of 98N is required to pull a body of mass 100Kg over ice. The coefficient of friction is
- 0.1
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 - chemical energy
66. A motor boat is travelling with a speed of 30ms^{-1} . If the force on it due to water flow is 500N, the power of the boat is
- 150KW
 - 1.5KW
 - 15KW
 - 150W
67. Nms^{-1} is the unit of
- impulse
 - power
 - energy
 - work
68. When the force retards the motion of a body the work done is
- zero
 - negative
 - positive
 - +ve or -ve depending upon situation
69. If the momentum of a body is doubled, the Kinetic energy is
- halved
 - unchanged
 - doubled
 - increased four time
70. A body falling from a height of 10m rebounds from the floor. If it loses 2% of energy in the impact, how high will it rebound?
- 10m
 - 8m
 - 12m
 - none of the above
71. A uniform force of 4N acts on a body of mass 8Kg for a distance of 2.0m. The K.E. required by the body is
- 8J
 - 64J
 - 4J
 - 16J
72. A force \vec{F} acting on a body moving in a circle of radius r is always perpendicular to the instantaneous velocity \vec{v} . The work done by the force on the body in one complete revolution is
- Fv
 - Fr
 - $F2\pi r$
 - 0
73. Watt day is the unit of
- power
 - energy
 - force
 - none
74. A hollow sphere and a solid sphere of same mass and radius are allowed to roll down an inclined plane from same height simultaneously. Which will reach the bottom first
- hollow sphere
 - solid sphere
 - both together
 - none of the above
75. Mass in linear motion has its analog in rotational motion
- moment of inertia
 - angular momentum
 - torque
 - weight

S.B. Roll No. _____

APPLIED PHYSICS
1st Exam/Common/5403/0351/Dec'11



M. Marks: 75

Duration : 2½ Hrs.

- | | | |
|---|---|--|
| 1. Mercury thermometers can be used to measure temperature upto
a. 100°C b. 212°C
c. 500°C d. 360°C | ice will
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b. slightly melt
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d. vanish in no time | 17. Which of the following has the smallest value?
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| 3. The process by which sun's rays reach the earth is
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The percentage errors in a,b,c are ±1%, ±3% and ±2% respectively. The percentage error in x can be
a. ±13% b. ±4%
c. ±7% d. ±1% |
| 5. By increasing the temperature of a liquid is
a. volume and density decrease
b. volume and density increase
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The dimensions of a,b,c are
a. [L ²][T][LT ⁻²] b. [LT ⁻²][L][T]
c. [LT ⁻²][LT][L] d. [L][LT][T ²] |
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a. [ML ⁻¹ T ⁻²] b. [MT ⁻²]
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- | | | |
|--|--|---|
| <p>50. A body falling from a height of 10m rebounds from the floor. If it loses 2% of energy in the impact, how high will it rebound?
a. 10m b. 8m
c. 12m
d. none of the above</p> <p>51. A uniform force of 4N acts on a body of mass 8Kg for a distance of 2.0m. The K.E. required by the body is
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b. volumetric
c. shearing d. none</p> <p>61. The property of metals which allows them to be drawn into thin wires beyond their elastic limit without rupture is called
a. ductibility
b. elasticity
c. malleability
d. hardness</p> <p>62. In steel the Young's modulus and the strain at the breaking point are $2 \times 10^{11} \text{ Nm}^{-2}$ and 0.15 respectively. The stress at the breaking point for steels is therefore
a. $1.33 \times 10^{11} \text{ NM}^{-2}$
b. $7.5 \times 10^{-3} \text{ Nm}^{-2}$
c. $1.33 \times 10^{12} \text{ Nm}^{-2}$
d. $3 \times 10^{10} \text{ Nm}^{-2}$</p> <p>63. If the temperature of a liquid is raised, then its surface tension is
a. decreased
b. increased
c. irregular
d. equal to viscosity</p> <p>64. Due to capillary action a liquid will fall in a tube, if the angles of contact is
a. acute b. obtuse
c. 90° d. zero</p> <p>65. The CGS unit of coefficient of viscosity is
a. poise b. newton
c. $\text{Kg-m}^{-1}\text{s}^{-1}$ d. gs/cm^{-1}</p> <p>66. The clouds float in atmosphere because of
a. their low temperature
b. their low viscosity
c. their low density
d. creation of low pressure</p> <p>67. Unit of modulus of elasticity is
a. dyne/cm b. dyne/cm^2
c. dyne-cm d. dynes</p> | <p>68. The meniscus of mercury in a capillary tube is
a. convex b. concave
c. plane d. uncertain</p> <p>69. Hooke's law essentially defines
a. stress
b. strain
c. field point
d. elastic limit</p> <p>70. Which one of the following quantities does not have the unit of force per unit area
a. stress
b. strain
c. Young's modulus of elasticity
d. pressure</p> <p>71. Water is flowing through a tube of non-uniform cross-section. If the ratio of the radius of the tube at the entrance and exit is 3:2 then the ratio of velocity of liquid entering and leaving the tube is
a. 8:27 b. 4:9
c. 1:1 d. 9:4</p> <p>72. Soap helps in better cleaning of clothes because
a. it reduces the surface tension of solution
b. it gives strength of solution
c. it absorbs the dirt
d. chemical of soaps change</p> <p>73. The temperature of a gas is a measure of
a. the average Kinetic energy of gaseous molecules
b. the average potential energy of gaseous modulus
c. the average distance between the molecules of the gas
d. the size of the molecules of the gas</p> <p>74. The temperature of a patient is 40°C, his temperature of Fahrenheit scale will be
a. 104°F b. 72°F
c. 96°F d. 100°F</p> <p>75. When water is heated from 0°C to 100°C its volume
a. increases
b. decreases
c. remains unchanged
d. first decreases and then increases</p> |
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