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SSC-I NATIONAL BOOK FOUNDATION FBISE

PHYSICS TEST - CHAPTER 5: PRESSURE AND DEFORMATION IN SOLIDS

Name:		Roll No.		Section:

Total Time: 2:30 Hour
Time Allowed: 150 Minutes

Total Marks: 150

PAPER OBJECTIVE
SECTION-A (MARKS 150)

NOTE: Section-A is compulsory. All parts of this section are to be answered on these pages and handed over to the center superintendent. Deleting / overwriting is not allowed. Do not use lead pencil.
Take g = 9.8 m/s² and density of water = 1000 kg/m³ wherever required.

Q.1 Fill the relevant bubble for each part. All parts carry one mark.

Questions	A	B	C	D	A B C D
1. A change in the size or shape of a body caused by an applied force is called:	elasticity	deformation	inertia	friction	○●○○
2. The ability of a deformed body to return to its original size when the force is removed is:	plasticity	brittleness	elasticity	viscosity	○○●○
3. Which of the following is an inelastic material?	Steel spring	Rubber band	Plasticine	Archer's bow	○○●○
4. Which material does NOT regain its shape after being deformed?	Clay	Rubber band	Steel spring	Tennis ball	●○○○
5. Materials behave elastically only up to a certain limit called the:	elastic limit	ultimate stress	breaking point	fracture limit	●○○○
6. Beyond the elastic limit, a material:	becomes more elastic	returns exactly to its shape	does not return to its original shape	becomes lighter	○○●○
7. Solids retain their shape easily because their atoms are:	far apart	closely packed	free to move	absent	○●○○
8. Compared to solids, deformation of liquids and gases needs:	more force	the same force	less force	infinite force	○○●○
9. Atoms of a solid return to equilibrium positions after the deforming force is:	doubled	applied again	removed	increased	○○●○
10. A stretched rubber band is an example of:	evaporation	condensation	radiation	deformation	○○○●
11. Hooke's law was stated by:	Isaac Newton	Blaise Pascal	Robert Hooke	James Watt	○○●○
12. Within elastic limits, the extension of a spring is directly proportional to the:	applied force	square of the force	square root of the force	reciprocal of the force	●○○○
13. In F = −kx, the negative sign shows that the restoring force is:	along the displacement	opposite to the displacement	zero	perpendicular to displacement	○●○○
14. The SI unit of spring constant is:	N m	N/m	N/m^2	kg/m	○●○○

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Questions	A	B	C	D	A B C D
15. The spring constant 'k' is the ratio of:	extension to force	force to extension	force to area	work to time	○●○○
16. A graph of stretching force against extension (within limit) is:	a parabola	a horizontal line	a straight line through the origin	a circle	○○●○
17. The gradient of a force–extension graph gives the:	work done	spring constant	pressure	elastic limit	○●○○
18. Hooke's law is obeyed up to the:	breaking point	ultimate stress	limit of proportionality	fracture point	○○●○
19. Beyond the limit of proportionality, the force–extension graph:	stays straight	becomes zero	reverses direction	begins to curve	○○○●
20. A spring with a larger spring constant is:	stiffer	softer	weightless	always longer	●○○○
21. If the stretching force on a spring is doubled (within limit), the extension:	halves	stays the same	doubles	becomes four times	○○●○
22. Hooke's law also holds for a wire under:	zero load	tension	melting	vibration only	○●○○
23. A force of 10 N stretches a spring of k = 200 N/m. The extension is:	0.5 m	0.05 m	5 m	20 m	○●○○
24. A spring (k = 500 N/m) is extended by 0.02 m. The force required is:	25 N	2.5 N	10 N	100 N	○○●○
25. A force of 40 N stretches a spring by 0.1 m. Its spring constant is:	400 N/m	40 N/m	4 N/m	4000 N/m	●○○○
26. A 2 kg mass stretches a spring by 0.04 m. Its spring constant is (g = 9.8 m/s^2):	49 N/m	490 N/m	4900 N/m	19.6 N/m	○●○○
27. A spring (k = 1000 N/m) is compressed by 5 cm. The restoring force is:	50 N	5 N	500 N	5000 N	●○○○
28. A spring of k = 800 N/m is stretched by 0.25 m. The force applied is:	20 N	3200 N	200 N	32 N	○○●○
29. A 5 N force gives an extension of 2 cm. The extension under 15 N (within limit) is:	4 cm	10 cm	6 cm	30 cm	○○●○
30. A spring extends 4 cm under 8 N. The load for a 10 cm extension is:	20 N	16 N	32 N	2 N	●○○○
31. The balance wheel of a mechanical watch is returned to its centre by a:	magnet	pendulum	lever	hairspring	○○○●

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Questions	A	B	C	D	A B C D
32. A spring scale is used to measure:	density	force (weight)	volume	temperature	○●○○
33. A spring balance works on the principle of:	Hooke's law	Pascal's principle	Boyle's law	Ohm's law	●○○○
34. A galvanometer uses a hairspring so that the deflection is proportional to:	mass	volume	temperature	current	○○○●
35. Which of the following is NOT an application of Hooke's law?	Spring scale	Car suspension	Hydraulic lift	Diving board	○○●○
36. Which device uses a spiral torsion spring to keep time steady?	Barometer	Manometer	Hydraulic jack	Mechanical watch	○○○●
37. Hooke's law is used in car suspension systems and in:	barometers	hydraulic brakes	manometers	diving boards	○○○●
38. In a spring scale, the extension of the spring is converted into a:	temperature reading	pressure reading	speed reading	weight reading	○○○●
39. Point A on a stress–strain curve is the:	limit of proportionality	elastic limit	ultimate stress	breaking point	●○○○
40. Point B on a typical stress–strain curve is the:	limit of proportionality	breaking point	origin	elastic limit (yield)	○○○●
41. Point C on a stress–strain curve represents the:	ultimate stress	elastic limit	proportional limit	zero stress	●○○○
42. Point D on a stress–strain curve is the:	yield point	proportional limit	breaking point	ultimate stress	○○●○
43. The maximum stress a material can bear before fracture is called:	yield strength	ultimate stress	proportional limit	elastic limit	○●○○
44. The elastic limit is also called the:	ultimate stress	fracture strain	proportional strength	yield strength	○○○●
45. The part of the curve up to the elastic limit is the:	plastic region	fracture zone	elastic region	ultimate zone	○○●○
46. Stress–strain curves are obtained using a:	barometer	manometer	hydraulic jack	stress testing machine	○○○●
47. A Rockwell tester is a machine used for testing:	air pressure	hardness	temperature	current	○●○○
48. Strain has:	unit of pascal	no unit	unit of newton	unit of metre	○●○○

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Questions	A	B	C	D	A B C D
49. Pressure is defined as:	force × area	area per unit force	force per unit area	force × distance	○○●○
50. The formula for pressure is:	P = FA	P = A/F	P = F/A	P = F/d	○○●○
51. The SI unit of pressure is the:	newton	pascal	joule	watt	○●○○
52. One pascal is equal to:	1 N/m^2	1 N m	1 N/m	1 kg/m	●○○○
53. For a given force, pressure increases when the area is:	decreased	increased	doubled	unchanged	●○○○
54. A balloon bursts when pricked with a pin because the pin tip gives:	high pressure on a small area	low pressure on a large area	less force	no force	●○○○
55. A high-heeled shoe hurts more because the weight acts on a:	larger area	zero area	heavier object	smaller area	○○○●
56. A sharp knife cuts better than a blunt one because it has a:	larger contact area	smaller force	smaller contact area	bigger mass	○○●○
57. A thumb pin enters a surface easily because its tip has a:	very large area	heavy mass	very small area	high temperature	○○●○
58. If the area is halved while the force is constant, the pressure becomes:	half	double	unchanged	four times	○●○○
59. If the force is tripled on the same area, the pressure becomes:	three times	one-third	nine times	unchanged	●○○○
60. Wide tyres on heavy vehicles help to:	increase pressure	reduce pressure on the ground	reduce mass	increase weight	○●○○
61. 1 kPa is equal to:	100 Pa	1000 Pa	10 Pa	10^6 Pa	○●○○
62. A force of 100 N acts on an area of 0.5 m^2. The pressure is:	200 Pa	50 Pa	20 Pa	500 Pa	●○○○
63. A force of 500 N acts on 0.25 m^2. The pressure is:	125 Pa	2000 Pa	200 Pa	1250 Pa	○●○○
64. A force of 90 N acts on an area of 30 cm^2. The pressure is:	3 kPa	300 kPa	2.7 kPa	30 kPa	○○○●
65. The force needed to produce 2000 Pa on an area of 0.05 m^2 is:	40 N	100 N	400 N	10 N	○●○○

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Questions	A	B	C	D	A B C D
66. A 60 kg boy stands on an area of 0.06 m^2. The pressure (g = 9.8 m/s^2) is:	9800 Pa	980 Pa	98 000 Pa	588 Pa	●○○○
67. If the same boy stands on one foot (half the area), the pressure becomes:	4900 Pa	9800 Pa	2450 Pa	19 600 Pa	○○○●
68. A block weighing 200 N rests on a face of area 0.4 m^2. The pressure is:	80 Pa	500 Pa	800 Pa	50 Pa	○●○○
69. An area of 1 m^2 under a force of 1 N gives a pressure of:	10 Pa	100 Pa	1 Pa	1 kPa	○○●○
70. A 10 kg box rests on a base of 0.2 m^2. The pressure (g = 9.8 m/s^2) is:	49 Pa	980 Pa	98 Pa	490 Pa	○○○●
71. Snow shoes prevent sinking in snow by:	decreasing the contact area	increasing the weight	heating the snow	increasing the contact area	○○○●
72. The force due to pressure on a surface acts:	parallel to the surface	at 45° to the surface	along the edges	perpendicular to the surface	○○○●
73. The pressure at the tip of a nail is ___ than at its head:	smaller	equal	greater	zero	○○●○
74. A force of 2400 N acts on an area of 0.6 m^2. The pressure is:	4000 Pa	1440 Pa	400 Pa	2400 Pa	●○○○
75. The area needed for a 250 N force to give 5 kPa is:	0.5 m^2	0.005 m^2	5 m^2	0.05 m^2	○○○●
76. A pressure of 3000 Pa on an area of 0.02 m^2 means a force of:	150 N	6 N	600 N	60 N	○○○●
77. The SI unit of pressure is named after:	Isaac Newton	Blaise Pascal	James Watt	Robert Hooke	○●○○
78. The pressure exerted by the air on the Earth's surface is called:	liquid pressure	vapour pressure	atmospheric pressure	elastic pressure	○○●○
79. The average atmospheric pressure at sea level is:	1.013 × 10^5 Pa	1.013 × 10^3 Pa	1.013 × 10^7 Pa	1.013 × 10^2 Pa	●○○○
80. One atmosphere (1 atm) is equal to:	1.013 × 10^5 Pa	1.013 × 10^3 Pa	1.000 × 10^5 Pa	760 Pa	●○○○
81. One bar is equal to:	1.013 × 10^5 Pa	1000 Pa	1.000 × 10^5 Pa	10 Pa	○○●○
82. The unit 'bar' is commonly used in:	optics	electronics	meteorology	genetics	○○●○

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Questions	A	B	C	D	A B C D
83. One millibar is equal to:	10 Pa	1000 Pa	1 Pa	100 Pa	○○○●
84. A pressure of 2000 mbar equals:	20 kPa	200 kPa	2 kPa	2000 kPa	○●○○
85. Standard atmospheric pressure in mm of mercury is:	76 mm Hg	7600 mm Hg	760 mm Hg	29.92 mm Hg	○○●○
86. Standard atmospheric pressure in cm of mercury is:	76 cm Hg	760 cm Hg	7.6 cm Hg	29.92 cm Hg	●○○○
87. Standard atmospheric pressure in inches of mercury is about:	7.6 in	29.92 in	76 in	760 in	○●○○
88. A mercury barometer has a tube inverted into a container of:	water	oil	alcohol	mercury	○○○●
89. In a mercury barometer, the height of the column represents the:	atmospheric pressure	density of mercury	temperature	humidity	●○○○
90. At sea level, the mercury column in a barometer rises to about:	76 mm	7600 mm	380 mm	760 mm	○○○●
91. Mercury barometers can be harmful to health because mercury is:	explosive	toxic	radioactive	magnetic	○●○○
92. A safer alternative to a mercury barometer is the:	aneroid barometer	spring balance	hydraulic lift	mercury U-tube	●○○○
93. Barometers are essential in aviation for measuring:	altitude	fuel level	wind direction	cabin colour	●○○○
94. As altitude increases, atmospheric pressure:	increases	stays the same	decreases	becomes infinite	○○●○
95. As altitude increases, the mercury column height in a barometer:	decreases	increases	stays the same	doubles	●○○○
96. A falling barometer reading may indicate an approaching:	clear sky	storm	earthquake	high tide	○●○○
97. A rising barometer reading generally suggests:	an approaching storm	improving weather	heavy rain	a cyclone	○●○○
98. The atmospheric pressure at the top of Mount Everest is about:	101 kPa	33 kPa	23 kPa	76 kPa	○●○○
99. At the cruising height of a Boeing 747, the atmospheric pressure is about:	33 kPa	101 kPa	23 kPa	50 kPa	○○●○

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Questions	A	B	C	D	A B C D
100. Climbers at high altitude find breathing difficult because air has less:	oxygen	hydrogen	water	helium	●○○○
101. At high altitude, the boiling point of water:	increases	stays the same	decreases	becomes zero	○○●○
102. Food takes longer to cook at high altitude because water:	boils at a lower temperature	boils at a higher temperature	has more air above it	has no gravity	●○○○
103. Compared with a mountain top, atmospheric pressure at sea level is:	smaller	equal	greater	zero	○○●○
104. Drinking through a straw works because atmospheric pressure pushes the liquid:	up the straw	down the straw	sideways	out of the cup	●○○○
105. When a syringe piston is pulled back, pressure inside the syringe becomes:	more than atmospheric	equal to atmospheric	infinite	less than atmospheric	○○○●
106. A suction cup sticks to a smooth wall because of:	gravity	magnetism	friction only	atmospheric pressure	○○○●
107. A sealed can collapses when air is pumped out because:	inside pressure increases	the can melts	outside air pressure is unopposed	gravity increases	○○●○
108. Otto von Guericke's experiment used two hollow:	iron cubes	glass tubes	bronze hemispheres	wooden cones	○○●○
109. In Guericke's experiment, the hemispheres fell apart when:	air was re-admitted	more air was removed	they were heated	they were cooled	●○○○
110. On a weather map, a high-pressure cell is shown by:	H	L	P	W	●○○○
111. On a weather map, a low-pressure cell is shown by:	H	Z	M	L	○○○●
112. Atmospheric pressure is 1.013×10^5 Pa. The force on a 2 m^2 area is:	1.013×10^5 N	2.026×10^5 N	5.065×10^4 N	2.026×10^3 N	○●○○
113. Pressure inside a liquid is due to its:	magnetism	weight	viscosity only	surface colour	○●○○
114. The pressure at depth h in a liquid of density ρ is:	ρh/g	ρgh	ρg/h	gh/ρ	○●○○
115. Liquid pressure at a point depends on:	base area only	volume only	depth and density	shape of the container	○○●○
116. Liquid pressure at a point does NOT depend on the:	depth	shape of the container	density of liquid	value of g	○●○○

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Questions	A	B	C	D	A B C D
117. In a can with holes at different heights, water spurts farthest from the:	highest hole	middle hole	all holes equally	lowest hole	○○○●
118. Pressure in a liquid increases with depth because of the weight of liquid:	below	beside	inside	above	○○○●
119. The pressure due to 10 m of water (ρ = 1000 kg/m^3, g = 9.8 m/s^2) is:	98 000 Pa	9800 Pa	980 000 Pa	10 000 Pa	●○○○
120. The pressure due to 2 m of water is:	1960 Pa	19 600 Pa	9800 Pa	196 000 Pa	○●○○
121. The pressure due to a 50 cm column of water is:	490 Pa	49 000 Pa	2450 Pa	4900 Pa	○○○●
122. Oil (ρ = 800 kg/m^3) at a depth of 2 m exerts a pressure of:	1568 Pa	7840 Pa	156 800 Pa	15 680 Pa	○○○●
123. If the depth in a liquid is doubled, the pressure becomes:	half	double	four times	unchanged	○●○○
124. Pressure due to 0.76 m of mercury (ρ = 13 600 kg/m^3) is about:	1.01×10^5 Pa	1.01×10^4 Pa	1.01×10^6 Pa	7.6×10^4 Pa	●○○○
125. A device that measures the pressure of a fluid is called a:	hygrometer	ammeter	manometer	voltmeter	○○●○
126. The pressure formula used in a manometer is:	P = ρgh	P = Fρ	P = mgh	P = mv	●○○○
127. In a manometer, one end is joined to the source and the other is:	sealed in vacuum	joined to a pump	closed	open to the atmosphere	○○○●
128. Which of the following is a type of manometer?	Aneroid	U-tube	Hairspring	Hydraulic	○●○○
129. A manometer can be used to measure:	mass	speed	colour	vacuum	○○○●
130. Which of these is an application of a manometer?	Leak testing	Measuring current	Measuring mass	Measuring time	●○○○
131. A barometer is used to measure only:	any fluid pressure	liquid levels	vacuum	atmospheric pressure	○○○●
132. The liquid generally used in a barometer is:	mercury	kerosene	milk	petrol	●○○○
133. Pascal's principle states that pressure applied to an enclosed fluid is transmitted:	downward only	to the piston only	equally in all directions	in a reduced amount	○○●○

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Questions	A	B	C	D	A B C D
134. Pascal's principle is applied in a:	spring balance	hydraulic lift	galvanometer	balance wheel	○●○○
135. For a hydraulic lift, F_1/A_1 is equal to:	$F_2 \times A_2$	A_2/F_2	F_2/A_2	F_2/A_1	○○●○
136. A small effort lifts a large load in a hydraulic press because:	pressure is reduced	fluid is lighter	gravity decreases	pressure is the same but area is larger	○○○●
137. In a hydraulic lift A_1 = 0.01 m^2, A_2 = 0.5 m^2, F_1 = 100 N. F_2 is:	5000 N	500 N	50 N	2000 N	●○○○
138. Piston areas are in the ratio 1 : 50. An effort of 20 N lifts a load of:	400 N	1000 N	2500 N	100 N	○●○○
139. 15 N acts on a piston of 3 cm^2. The force on a 60 cm^2 piston is:	45 N	900 N	300 N	3 N	○○●○
140. Piston diameters are 2 cm and 10 cm. A 40 N effort on the small piston gives:	1000 N	200 N	800 N	160 N	●○○○
141. In a hydraulic system, the pressure on both pistons is:	equal	greater on the small piston	greater on the large piston	zero	●○○○
142. Hydraulic brakes in a car work on:	Hooke's law	Pascal's principle	Boyle's law	Ohm's law	○●○○
143. In hydraulic brakes, the pedal pushes the piston of the:	brake pad	wheel rim	disk rotor	master cylinder	○○○●
144. Brake fluid carries pressure to the wheels through:	clutch plates	axles	exhaust pipe	brake lines	○○○●
145. At each wheel, brake pressure acts on the:	brake calipers / wheel cylinders	master cylinder	brake pedal	engine	●○○○
146. The force produced by pressure in a blown balloon acts:	parallel to the surface	at an incline	perpendicular to the surface	nowhere	○○●○
147. Deep-sea divers need special suits because pressure increases with:	height	depth	temperature	speed	○●○○
148. A 12 000 N car is lifted using pistons of 0.002 m^2 and 0.6 m^2. The effort needed is:	400 N	4 N	36 N	40 N	○○○●
149. After pumping a bicycle tyre, the pressure increases by an equal amount:	only near the pump	only at the valve	nowhere	throughout the tyre	○○○●
150. The pressure due to 30 m of water (g = 9.8 m/s^2) is:	29 400 Pa	2940 Pa	30 000 Pa	294 000 Pa	○○○●

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