S.2 PHYSICS | REVISION QUESTIONS

TOPIC: **Mechanical Properties**

Attempt the Questions and submit Work for Marking on the eLearning Platform **Q &A Forum** or to Mr. Ssendawula (WhatsApp : 0700 37 7992)

1. A material that can be rolled into sheets or drawn into wires without breaking is said to be

A. strong. **C.** ductile.

B. elastic. **D.** brittle.

2. Reinforced concrete is stronger than ordinary concrete because concrete and steel are

A. both brittle materials. **C.** strong in tension and compression respectively.

B. both ductile materials. **D.** strong in compression and tension respectively.

3.Which of the following are brittle substances '?

A. Dry clay, steel, chalk and wood. **C.** Glass, chalk, concrete and steel.

B. Chalk, steel, plastic and glass. **D.** Dry clay, glass, chalk and concrete .

4.A load of 4 N stretches a spring by 0.5cm. Calculate the extension when a load of 8 N is applied.

A. 0.25 cm C. 2.0 cm

B. 1.0 cm **D.** 4.0 cm

5. A beam may be designed with much of its central part removed in order to improve on its

A. brittleness. C. ductility.

B. stiffness. **D.** stability.

6. Which of the following are all brittle materials ?

A. Leather, rubber, thread. **C.** Glass, cast iron, stone.

B. Clay, glass, wood. **D.** Rubber, polyster, copper wire.

7. The beam in figure 2 is being acted on by a weight W.

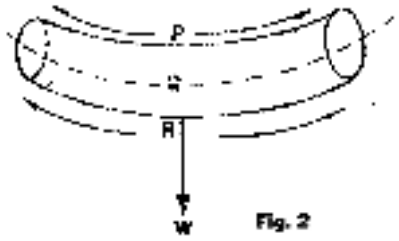


Fig. 2

8. A mass of 0.5 kg causes a spiral spring to extend by 4 cm. The force that would cause an extension of 6cm is

A. 2.0 N
C. 4.8 N
B. 3.3 N
D. 7.5N

9. A rod of cross-sectional area 40 cm^2 needs a tensile force of 2 N to break it. What is its breaking stress ?

A. 0.005 N m^{-2}
C. 5 N m^{-2}
B. 0.05 N m^{-2}
D. 500 N m^{-2}

10. An object is said to behave elastically when

A. its elastic limit is exceeded

B. its breaking point is reached.

C. equal increases in the force applied to it produce equal changes in length.

D. the potential energy stored in it is used to permanently deform the object.

11. The diagram in figure 7 shows a structure of wooden beams P, Q, R, S and T supporting a heavy rod L.

12. In a wire supporting a load, stress is given by

A. $\frac{\text{Stress}}{\text{Area}}$ C. $\frac{\text{Area}}{\text{Stress}}$

B. Force × Area **D.** $\frac{\text{Force}}{\text{Area}}$

13. A load of 500 N is placed at 2 m from a pivot of a sea saw. At what distance from the pivot should a weight of 250 N be placed to balance the sea-saw?

A. 0.5 m **C.** 2.0 m

B. 1.0 m **D.** 4.0 m

14. A mass of 0.2 kg produces an extension of 8 cm in d spring. The force required to produce an extension of 6 cm is

A. 0.75 N. **C.** 2.70 N.

B. 1.50 N **D.** 24.00 N.

15. Figure 1 below shows a graph of extension against load for an elastic material.

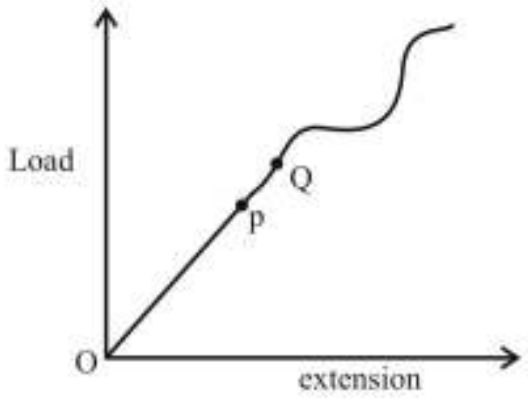


Fig.

In the region OP, the material is,

A. elastic and obeys Hooke's law.

B. elastic but does not obey Hooke's law.

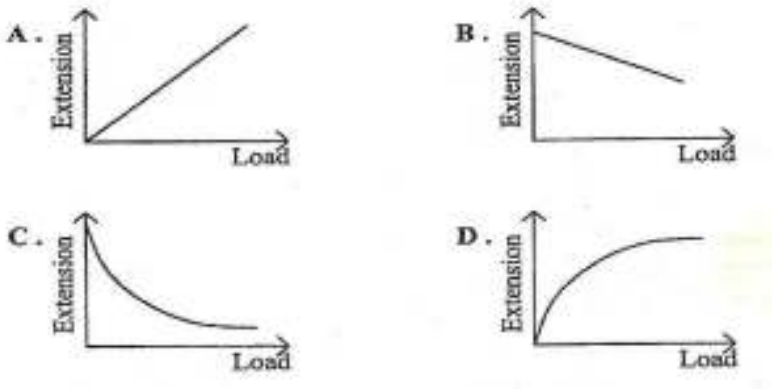
C. plastic but obeys Hooke's law.

D. plastic but does not obey Hooke's law.

16. A Material which undergoes a large amount of extension before it breaks is called

A. ductile
B. brittle
C. plastic
D. elastic

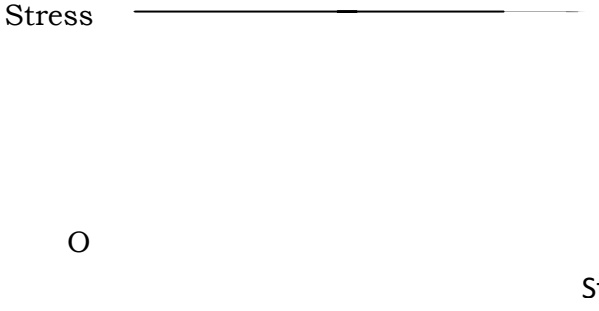
17. Which one of the following graphs represents the variation of extension of a spring with load.



18.A force of 2 N produces an extension on a spring of 3cm. Find the weight of a stone that produces an extension of 18cm.

A. 3 N
B. 6 N
C. 12 N
D. 108 N

19. Which one of the following statements is correct about the stress – strain graph of a wire?



A. The wire only obeys Hooke's law between O and A it becomes much more difficult to stretch it.
B. The wire does not obey Hooke's law between O and A and after A, it becomes much more difficult to stretch it.

C. The wire only obeys Hooke's between O and A and after A, it becomes much easier to stretch it.

D. The wire does not obey Hooke's law between O and A and after A, it becomes much easier to stretch it.

20. A mass of 600g produces an extension of 15cm in a spring. Find the extension produced by a force of 12.0N.

A. 4.8cm B. 7.5 cm C. 10.8cm D. 30.0cm

21. A notch on a material spreads more rapidly when the material is;

A) reinforced B) in tension

C) pre stressed D) in compression

22. A girder under compression is called

A. strut B. tie
C. beam D. pillar

ESSAY.

1. (a) Name any two constituents of a concrete material.

(b) State any two characteristics which make concrete a desirable building material.

(c) State any two ways in which concrete may be reinforced.

2. (a)(i) What is a notch?

(ii) State two ways of reducing notch effect?

(b) What is the difference between a tie and a strut?

3. (a) (i) State Hooke's law. (1 marks)
(ii) Differentiate between a tie and a strut. (2 marks)
(iii) State any two ways in which concrete can be reinforced. (2 marks)

(b) Describe an experiment to verify Hooke's law. (4 marks)

(c) An elastic spring of natural length 30cm is stretched by a force of 50N to a length of 80cm. Calculate its extension if a force of 40N is applied to it. (2 marks)

4. (a) Define the terms *strain* and *stress*.

(b) Figure 2 shows a diagram of a bicycle.

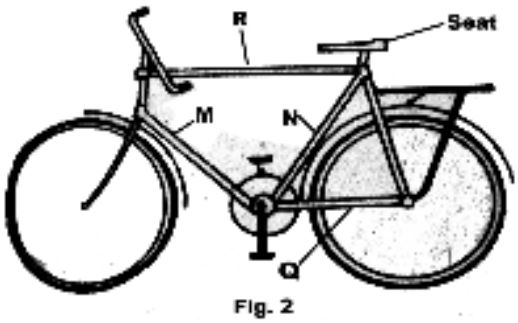


Fig. 2

Which ofthe parts, labelled *M, N, Q* and *R*, would be

(i) in tension.

(ii) in compression when a heavy person sits on the seat?

(c) Give four reasons why bicycle frames are made of hollow cylindrical