

2021  
THEORY

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය , 2021 අගෝස්තු  
 කல்විප් பொதுத் தராதரப் பத்திர(உயர் தர)ப் பரீட்சை, 2021 ஓகஸ்தர்  
 General Certificate of Education (Adv. Level) Examination, August 2021

භෞතික විද්‍යාව I  
 பொளதிகவியல் I  
 Physics I

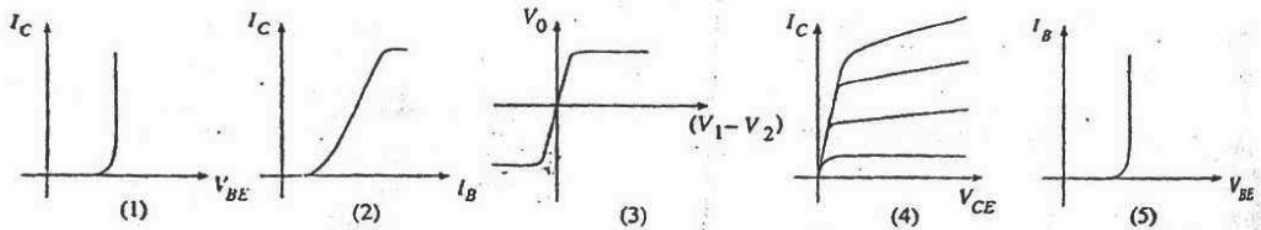
Advanced Level Physics  
 Amith Pussella

PHT6210 2021Th 2021-05-07

Multiple Choice Questions

1. 3. Of the elements given below, power ( $VI$ ) can be amplified only with  
 (1) resistors. (2) diodes. (3) capacitors.  
 (4) transformers. (5) transistors.

2. Which of the curves shown in figures represents the output characteristic of an *npn* transistor?



3. If the mass of a radioactive sample is doubled, which of the following is correct, regarding its activity and its half-life.

Activity	Half-life
(1) Increases	Increases
(2) Increases	Decreases
(3) Increases	Remains the same
(4) Remains the same	Remains the same
(5) Remains the same	Decreases

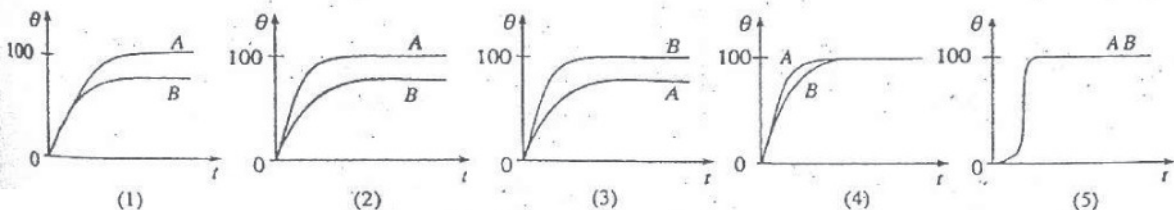
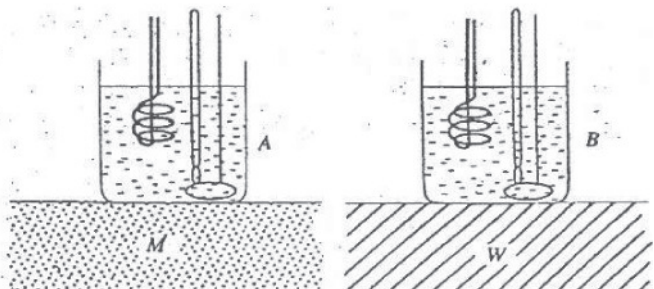
4. Three identical straight metal wires are subjected to the following changes separately:

- (A) the length is increased by stretching.  
 (B) the temperature is increased.  
 (C) the wire is coiled into a solenoid.

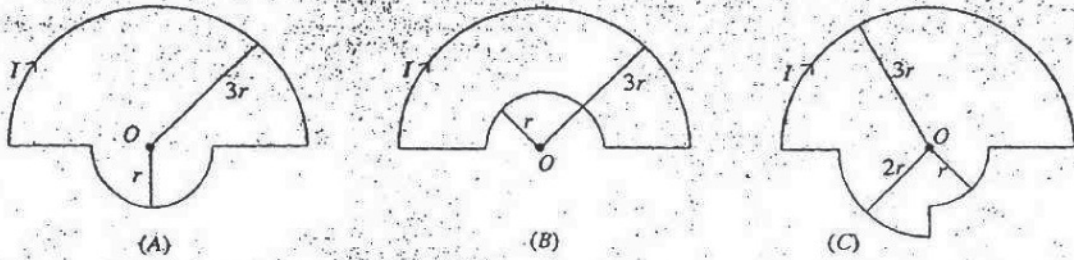
Which of the above will cause an increase in the resistance of the wire?

- (1) (A) only. (2) (B) only. (3) (C) only.  
 (4) (A) and (B) only. (5) all (A), (B) and (C).

5. Two identical thin metal cans *A* and *B* containing equal amounts of water are heated using two identical domestic electrical heaters. As shown in the figure, the cans *A* and *B* are kept on a large metal block (*M*) and a large wooden block (*W*) respectively. Which of the following curves best represents the variation of temperature ( $\theta$ ) of water in *A* and *B* with time (*t*) ?



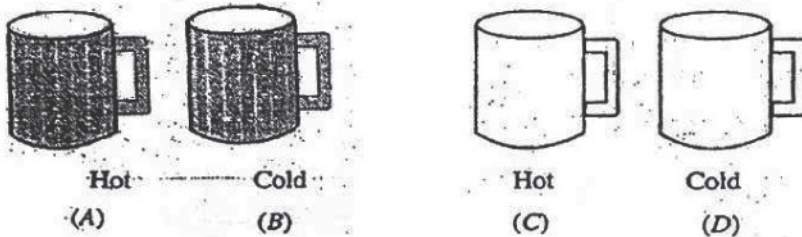
6.



The figure shows three loops A, B and C consisting of concentric circular arcs (either half or quarter-circles of radii  $r$ ,  $2r$  and  $3r$ ). The loops carry the same current  $I$ . If the magnetic flux densities produced at  $O$  by each loop is  $B_A$ ,  $B_B$  and  $B_C$  respectively, then

- (1)  $B_A > B_C > B_B$                       (2)  $B_A = B_B = B_C$                       (3)  $B_A > B_B > B_C$   
 (4)  $B_A < B_C < B_B$                       (5)  $B_A = B_B > B_C$

7.

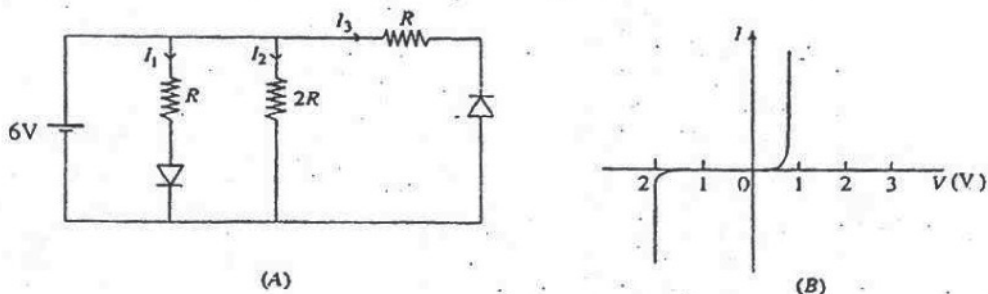


A, B, C and D are four cups of same size. A and B have rough black surfaces and C and D have smooth shining surfaces.

A and C are filled with hot tea at  $50^\circ\text{C}$  and B and D are filled with cold tea at  $10^\circ\text{C}$ . If the room temperature is  $30^\circ\text{C}$  which of the following is true?

- (1) A cools faster than C, and B warms faster than D  
 (2) A cools slower than C, and B warms faster than D  
 (3) A and C cool at the same rate, and B warms faster than D  
 (4) A cools slower than C, and B warms slower than D  
 (5) A cools faster than C and B warms slower than D

8.



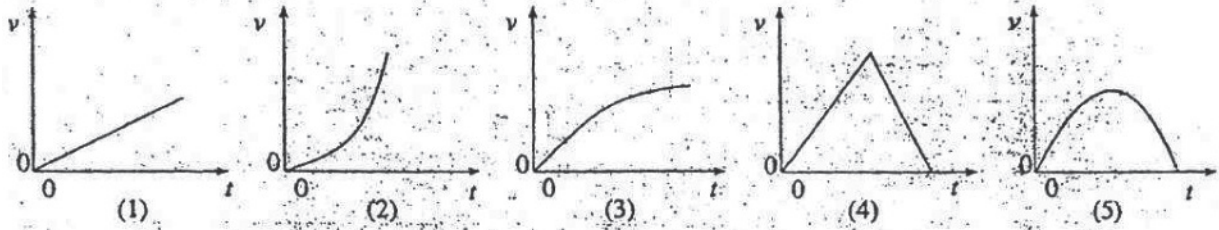
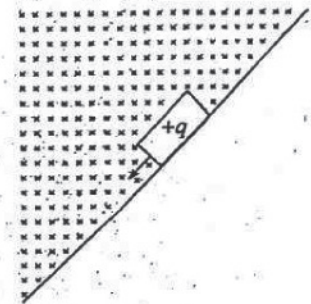
$I$  -  $V$  characteristic of the silicon diodes shown in circuit (A) is given in figure (B). 6 V cell has negligible internal resistance. Of  $I_1$ ,  $I_2$  and  $I_3$ , the maximum and the minimum currents respectively, are

- (1)  $I_2$  and  $I_1$                       (2)  $I_3$  and  $I_2$                       (3)  $I_1$  and  $I_2$                       (4)  $I_3$  and  $I_1$                       (5)  $I_1$  and  $I_3$

9.

An object carrying a positive charge slides down a long inclined rough plane from rest. A uniform magnetic field is acting as shown in the figure.

The variation of the velocity  $v$  of the object with time  $t$  is best represented by



10. A circular conducting loop moves at a constant velocity through two regions consisting of magnetic fields. The magnetic fields in the two regions are uniform and have the same magnitude but acting in opposite directions as shown in the figure. The induced e.m.f. ( $E$ ) in the loop varies with time ( $t$ ) as

