END TERM EXAMINATION

FIRST SEMESTER [BCA] DECEMBER-2012

Paper Code: BCA109

Subject: Physics

Time: 3 Hours

Maximum Marks:75

Note: Attempt any five questions. Select one question from each unit including Q.no.1 which is compulsory.

- Q1 (a) According to Newton's third law, "action and reaction are equal and opposite". Then why don't these two forces cancel each other?
 - (b) A boy is running with constant speed on a circular track. Is it an accelerated motion? If yes, then explain briefly the force that is acting on the boy to keep him in circular motion.
 - (c) A man of mass 60kg climbs a ladder of height 5m. Calculate the work done by the force of gravity. Take g=10m/s².
 - (d) "Static friction is a self adjusting force" Is this statement true? Justify your answer.
 - (e) Explain briefly elastic and perfectly inelastic collisions.
 - (f) Define Ohm's law. Is it a fundamental law or valid only for certain materials and devices? Justify your answer.
 - (g) 5J of work is done in moving a positive charge of 0.5C from one point to another. What is the potential difference between the two points?
 - (h) Write the two important conclusions of Rutherford's α -particle scattering experiment.
 - (i) Write the difference between metals, insulators and semiconductors on the basis of energy bands in solids.
 - (j) Name the majority and minority carriers in p-type and n-type semiconductors. (2.5x10=25)

UNIT-I

- Q2 (a) What is wrong with the statement, "Because the car is at rest, there are no forces acting on it"? How would you correct the statement? (4.5)
 - (b) A person weighs a fish on a spring scale attached to the ceiling of an elevator. Show that is the elevator accelerates upwards or downwards, the spring scale reads an apparent weight different from the fish's true weight. Justify your answers by drawing free body diagrams of the fish.

 (8)
- Q3 (a) State the laws of limiting friction. (5)
 - (b) The outer rail of a curved railway track is generally raised over the inner. Why? Explain briefly. (7.5)

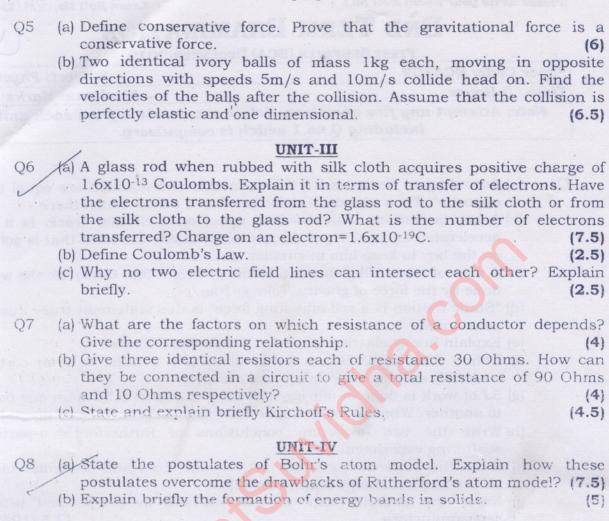
UNIT-II

- Q4 Define work. What do you understand by negative work done by a force? (4)
 - (b) Does kinetic energy of a body depend upon the direction of motion?

 Justify your answer. (3)
 - (c) A toy car of mass 0.2kg is moving with speed 10m/s. Find its kinetic energy. If the car stops due to friction, find the work done by the force of friction.

 (5.5)

P.T.O.



(a) Discuss briefly electrical conduction in semi conductors.

(b) Which biasing makes the p-n junction resistance low? Justify your

(c) What is a transistor? Write briefly the action of a n-p-n transistor. (5)

(4)

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