No. of Printed Pages : 5 **BET-012**

Diploma in Civil Engineering / Diploma in Electrical & Mechanical Engineering

DCLEVI/DMEVI/DELVI/DECVI/DCSVI/ ACCLEVI/ACMEVI/ACELVI/ACECVI/ACCSVI

Term-End Examination

00179

June, 2012

BET-012 : PHYSICS

Time : 2 Hours *Maximum Marks : 70*

Note : *Question no. 1 is* ***compulsory****. Attempt* ***any four*** *questions from question no. 2 to* ***question No.7****. Use of calculator is* ***permitted****.*

Choose the correct alternative.

1. (a) The SI unit of surface tension is : **14x1=14**

(i) Nm^{-2} (ii) Nm^{-1}

(iii) Nm (iv) Nm^2

(b) The flow of fluid is steady means that the :

(i) fluid motion does not suffer any friction.

(ii) fluid velocity does not change with time.

(iii) fluid velocity change with time.

(iv) none of the above.

(c) Venturi Meter works on :

(i) Pascal's law

(ii) Bernoulli's principle

(iii) Archimede's principle

(iv) none of these

(d) Triple point of water refers to the state where pure water coexists as a mixture of :

(i) ice and liquid

(ii) liquid and vapour

(iii) ice and vapour

(iv) ice , liquid and vapour

(e) The mechanism through which heat can be transfered in vacuum is :

(i) radiation (ii) conduction

(iii) convection (iv) none of these

(f) An example of electromagnetic wave is :

(i) gamma rays

(ii) waves on water surface

(iii) waves on strings

(iv) sound waves

(g) The sound is known as ultrasound when frequency of the sound :

(i) range 20 Hz to 20,000 Hz

(ii) is less than 20 Hz

(iii) is more than 20,000 Hz

(iv) none of these

(h) The velocity of sound in air for 20°C rise in temperature is :

(i) 343.2 ms^{-1}

(ii) 363.3 ms^{-1}

(iii) 331 ms^{-1}

(iv) 393.4 ms^{-1}

(i) The focal length of a concave mirror of radius of curvature 30 cm is :

(i) 60 cm (ii) 7.5 cm

(iii) 30 cm (iv) 15 cm

(j) The SI unit of power of a lens is :

(i) Hz (ii) Wb

(iii) Pa (iv) Dioptre

(k) For converging lens, the power is :

(i) positive (ii) negative

(iii) zero (iv) none of these

(*l*) The kilowatt hour (KWh) is the unit of :

(i) power (ii) current

(iii) electrical energy (iv) time

(m) Daniel cell develops an e.m.f of :

(i) 0.1V (ii) 1.1V

(iii) 0.5V (iv) 2.05V

(n) Gold is a :

(i) diamagnetic substance

(ii) paramagnetic substance

(iii) ferromagnetic substance

(iv) none of these

2. (a) State Pascal's law. Explain its one application. **4+4+6**

(b) Define co -efficient of viscosity of a fluid. Write its SI unit.

(c) A load of 5.0 kg attached to a steel wire of radius 2.0 mm is suspended from a ceiling. Calculate the tensile stress developed in the wire. Given $g = 9.8\ ms^{-2}$.

3. (a) Define specific heat capacity of a substance. How is molar heat capacity different from specific heat capacity ? **4+4+6**

(b) State Stefan - Boltzmann law. Write its mathematical expression.

(c) Calculate mean kinetic energy for one gram mole of hydrogen at S.T.P. Given density of hydrogen at S.T.P is 0.09 Kgm^{-3}.

4. (a) Define Pitch of a sound. What are the two factors on which pitch of a sound depends ? **4+4+6**

(b) The velocity of sound in air is 330 ms^{-1}. Calculate the wavelength of sound of frequency 20 Hz.

(c) What are longitudinal and transverse waves ? Depict these graphically. Give example of each.

5. (a) What is reflection ? State two laws of reflection. **4+4+6**

(b) Define power of a lens. How it is related with focal length ?

(c) Determine the location and nature of images formed by a convex lens when the object is placed at :

(i) 2F (ii) F

6. (a) State Coulomb's law of electrostatistics. Write its mathematical expression. **4+4+6**

(b) Differentiate between direct current and alternate current.

(c) A wire 2 m long and 0.40 mm in diameter has a resistance of 4 Ω. Calculate the resistivity of the material of the wire.

7. Write short notes on *any four* of the following : **4x3½=14**

(a) Meter bridge

(b) Secondary cell

(c) Astronomical Telescope

(d) Biot - Savart's law

(e) Galvanometer

(f) Paramagnetic substances