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**3rd Sem / Civil Engineering, Brick Tech, Const Mgmt, Highway Engg.**

**Subject:- Fluid Mechanics**

Time : 3Hrs. M.M. : 100

## SECTION-A

**Note:** Multiple choice questions. All questions are compulsory (10x1=10)

Q.1 The density of water is maximum at
- a) 0°C.
- b) 4°C.
- c) 273 K.
- d) 300 K.

Q.2 Surface tension of liquid
- a) Increases with area
- b) Decreases with temperature
- c) Increases with temperature
- d) Decreases with area

Q.3 Falling drops of water become spherical due to
- a) Adhesion
- b) Cohesion
- c) Viscosity
- d) Surface tension

Q.4 Pressure intensity exerted by 1m column of water is
- a) 9.81 kPa
- b) 1.02 kPa
- c) 9 kPa
- d) 7.85 kPa

Q.5 For an immersed body, centre of pressure lies
- a) Slightly above the C.G
- b) At the point of C.G
- c) Below the C.G
- d) None of the above



Q.6 Mercury is used for pressure of
- a) High ranges
- b) Low ranges
- c) Sensitive range
- d) None of the above

Q.7 Piezometer measures
- a) Gauge pressure
- b) Absolute pressure
- c) Vacuum pressure
- d) None of the above

Q.8 Orifices are used to measure
- a) Pressure
- b) Rate of flow
- c) Viscosity
- d) Surface tension

Q.9 The S.I unit of discharge is
- a) m/s
- b) $m^2/s$
- c) $m^3/s$
- d) $m^4/s$

Q.10 The velocity at which flow changes from laminar to turbulent is called
- a) Supersonic velocity
- b) Escape velocity
- c) Critical velocity
- d) None of the above

## SECTION-B

**Note:** Objective type questions. All questions are compulsory. (10x1=10)

Q.11 Define fluid.

Q.12 Define mass density of fluid.

Q.13 Define viscosity.

Q.14 What is the value of specific weight of water?

Q.15 Define centre of pressure.

Q.16 Define total pressure.

Q.17 S.I unit of pressure of liquid is_____.

Q.18 Define atmospheric pressure.

Q.19 Define hydraulic gradient line.

Q.20 Define water hammer.

## SECTION-C

**Note:** Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Define hydraulic press and mechanical advantage of hydraulic press. (CO3)

Q.22 Write short note on Bourdon's tube pressure gauge. (CO4)

Q.23 Write down five advantages and disadvantages of manometers. (CO4)

Q.24 Explain Uniform and Non-uniform flow. (CO5)

Q.25 State Continuity equation of flow. (CO5)

Q.26 In a pipe of 100 mm diameter, water is flowing with a mean velocity of 3 m/s and a gauge pressure of 300 $kN/m^2$. Determine the total head, if the pipe is 10 m above the datum line. Neglect friction. (CO5)

Q.27 Write the functions of a venture-meter. (CO6)

Q.28 Define orifice and mouth piece. (CO6)

Q.29 Find the discharge from a 100 mm diameter external mouthpiece fitted in a large tank, if the head over the mouthpiece is 6m. Take $C_d = 0.855$. (CO6)



Q.30 Explain Reynold's Number and critical velocity. (CO7)

Q.31 Explain minor head losses and name various minor head losses. (CO7)

Q.32 A rectangular channel section having hydraulic mean depth 0.7 m discharges water with a velocity of 2m/s. Find the value of Chezy's constant, if the bed slope of the channel is 1 in 2200. (CO8)

Q.33 Define hydraulic mean depth for a trapezoidal section. (CO8)

Q.34 Define most economical channel section. (CO8)

Q.35 Write a short note on Centrifugal pump. (CO9)

## SECTION-D

**Note:** Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 Define Pascal's law of pressure and explain two applications of it in detail. (CO3)

Q.37 Calculate the discharge in litre/min. through a pipe of diameter 20 cm in a length of 700 m. The difference of pressure heads between the two ends of a pipe is 2.2 m. Take f = 0.007. (CO7)

Q.38 A trapezoidal channel 4m wide at bottom and side slope 1:1.5 has a bed slope of 1 in 500. Find the discharge through the channel if water flows 1m deep. Take N=0.035. (CO8)