

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**End Semester Examination, May 2018**

**Course: Water supply, sanitation and refugee health in emergency**  
**Program: B.TECH (FSE)**  
**Time: 03 hrs.**

**Semester: VI**  
**Course Code: FSEG324**  
**Max. Marks: 100**

**SECTION A** (Attempt all the question, 5\*4=20 Marks)

1. Differentiate between displacement types and centrifugal type pumps. [CO3]
2. The total coliform bacteria test is a primary indicator of portability and suitability for consumption of drinking water. It measures the concentration of total coliform bacteria associated with the possible presence of disease causing organisms. Write different types of microbial testing for water quality assessment. [CO2]
3. What are the different flood discharge formula applicable for Indian catchment? [CO4]
4. Expand the following [CO1]
  - a) ACMR
  - b) WHO
  - c) AWWA
  - d) MUD
  - e) CPHEEO
5. The population of a city in 2000 is 50,000. The average increase in population over last 8 decades is 7500 and average incremental increase during 8 decades is 750. Find the population of the city based on incremental method, in the year 2020. [CO2]

**SECTION B** (Attempt only four question, 4\*10=40 Marks)

6. What area will sufficient for a flash flood in central region of India if the discharge is about  $350000\text{m}^3/\text{s}$ ? [CO3]
7. Studies on the incidence of phages and various microbes in water have been reported from most parts of the world therefore it is important to check the quality of water before supply else it will lead to multiple water born disease, discuss short notes on water born disease. [CO3]
8. Find the capacity require for a pumping station for the following data: [CO4]

*Population to be searved: 2lacs*  
*Daily demand of water: 135lpcd*  
*Water level in the river: 120m*

*Pumping hour: 24hr/day*

*To be pumped to treatment plant of R.L 140m*

*The diameter of rising main is 90 cm, which gives losses due to friction etc. 2m.*

*The efficiency of pumps and driving motors can be taken as 70% and 90% respectively.*

9. What is hygiene promotion? Mention various areas of Concern in Hygiene promotion. Explain the key principles of hygiene promotion. Mention various areas of training to promote hygiene. [CO5]

**OR**

10. What control measures will you take to reduce risk to water borne diseases?  
[CO3]

**SECTION-C**

**(Attempt only two question, 2\*20=40 Marks)**

11. A large service reservoir supplies water to two colonies as under:  
[CO2]

Colony A: Population 12,000

Colony B: Population 60,000

Determine (a) the hydraulic gradient at which the pipeline should be laid, (b) the sizes of the supply conduits. Assume average daily water consumption as 200 lit/capacity/day.

12. For water supply of a town, water is pumped from a river which is 3km away into a reservoir. The maximum difference of level of river and reservoir is 20m. The population of the town is 50000 and per capita water demand is 120lpcd. If the pump are to operate for a total of 8hr and efficiency of pump is 80% calculate the BHP of the pumps. Assume coefficient of friction as 0.0075, the velocity of pipe as 2m/sec and maximum daily demand as 1.5 times of average daily demand.  
[CO3]

**OR**

13. In recent years, sanitation has risen up the international policy agenda. In 2002, sanitation was included in the Millennium Development Goals (MDGs), and specifically within MDG 7, Target 10, which sets the aim of halving 'by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation'. Yet, at national level in most developing countries, hygiene and sanitation do not yet receive much attention, despite important health implications. What do you think about multiple challenges for maintaining hygiene during water supply explain those challenges and also focus on the remedial action which you will implement if you have been appointed as HSE officer.  
[CO4]

Name:

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