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**UNIVERSITY OF PETROLEUM & ENERGY STUDIES
DEHRADUN**

End Semester Examination – December, 2017

Program/course: APEVII(Upstream)APEVII(Gas)

Semester – VII

Subject: Production Engineering II

Max. Marks : 100

Code : PTEG 422

Duration : 3 Hrs

No. of page/s: 2

Please read the instructions and question carefully and give precise answers

SECTION A

20 MARKS (5*4)

ALL QUESTIONS ARE COMPULSORY

Q.1 Write design procedure for a heater treater.

Q.2 What is the function of pulsation dampener for a plunger pump?

Q.3 What is principle of working of metal loss detection pig? Name two different types of such pigs.

Q.4 What is the purpose of well manifold in an oil and gas processing facility?

Q.5 Write equation for calculation of pipe thickness for offshore pipe lines as per code B31.3

SECTION B

Marks 60 (5*12)

Question numbers 6,7,8,9 is compulsory and attempt any one from the rest

Q.6 Write simplified friction pressure drop formula as per API RP14E along with its boundary conditions. How pipe line diameter and pressure drop is calculated using this equation? Explain with relevant equations **(12)**

Q.7

(a) Entire chain of operations exposes process equipment to corrosion. Discuss means to protect storage tanks from corrosion. **(6)**

(b) Explain thermodynamic criteria of corrosion. What inferences can be drawn using Bedworth Pilling ratio? **(6)**

Q.8

(a) How the performance of a centrifugal pump can be changed? Write affinity laws. **(6)**

(b) Draw typical performance curve for a centrifugal pump and explain significance of best efficiency point. **(6)**

Q.9

(a) Write compression theory for gas compressors? How horse power is calculated for a centrifugal compressor? (6)

(b) Explain centrifugal compressor performance with relevant graph? (6)

Q.10

(a) What are different factors which affect accuracy of a positive displacement meter. (6)

(b) What is K factor for a turbine meter. What are different factors which affect accuracy of a turbine meter. (6)

Q.11 Define theoretical lift, actual lift, acceleration head and total dynamic head. How total dynamic head is calculated? For positive displacement pump how power requirement is calculated? (12)

SECTION C

Marks 20 (1*20)

Q12

(a) What is the function of a demister? Write procedure of demister area calculation. (10)

(b) Calculate demister area to be installed in a separator operating at following conditions:
Oil flow rate of 2000b/d, Gas flow rate 10MMscfd, Gas specific gravity 0.6 Oil density 50lb/cu.ft Operating.pr 1000psi, Operating.temp.60°F, K_d - 0.35 ft/sec and Z factor 0.84 (10)

