Roll No: ----------

UPES

UNIVERSITY OF PETROLEUMAND ENERGY STUDIES

End Semester Examination, December 2017

Program: B Tech Electrical Engineering | **Semester – III**
Subject (Course): Power Generation Engg | **Max. Marks : 100**
Course Code : PSEG 221 | **Duration : 3Hrs**
No. of page/s: 01

SECTION-A (Attempt all questions) **20 Marks**

1	Explain under what conditions diesel generating plants are preferred compared to other generation plants	**[4]**	**CO2**
2	What factors should be taken into consideration while selecting the site of nuclear power plant	**[4]**	**CO2**
3	Define Canning? And write the materials which are suitable for canning?	**[4]**	**CO1**
4	Explain the working principle of the following (i) Super heater (ii) Economizer (iii) Air Preheater	**[4]**	**CO2**
5	Calculate the fission reaction rate of Pu^{239} for producing a power of one watt and energy released in the complete fission of 3 gm of Pu^{239} per 12hrs	**[4]**	**CO4**

SECTION-B (Attempt all questions) **40 Marks**

6	Explain the following boilers and compare both : a) Fire tube boiler b) Water tube boiler	**[10]**	**CO3**
7	Describe the working & operation of Fast Breeder Reactor with neat sketch and explain how it is different from Thermal Reactor.	**[10]**	**CO3**
8	Describe with a neat sketch, the working of a closed cycle gas turbine	**[10]**	**CO2**
9	A steam power station of 300 MW capacity uses coal of calorific value 6200 kcal/kg. The thermal efficiency of station is 45% and electrical generation efficiency is 82%. Find the coal require per hour when plant is working at full load.	**[10]**	**CO4**

SECTION-C **40 Marks**

10	a) Draw a neat diagram of nuclear reactor and explain the function of its components	**[10]**	**CO3**
	b) Write a short note on fertile materials and what do you mean by Chain reaction?	**[10]**	**CO3**
11	With the help of neat sketch Explain the construction and working of a four stroke diesel cycle engine	**[20]**	**CO3**
	OR		
11	With the help of neat sketch Explain the construction and working of a two stroke diesel cycle engine	**[20]**	**CO3**

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SECTION-A — 20 Marks

(Attempt all questions)

1	Define the terms (a) Multiplication Factor (b) mass defect	**[4]**	**CO1**
2	What are the advantages and disadvantages of diesel power plants	**[4]**	**CO2**
3	Describe the Disadvantages/ limitations of Nuclear power generation	**[4]**	**CO1**
4	Calculate the power produced by fissioning 1 kg of U^{235} per day	**[4]**	**CO2**
5	Explain the purpose of the following (i) Spillway (ii) Surge Tank (iii) Penstock	**[4]**	**CO1**

SECTION-B — 40 Marks

(Attempt all questions)

6	Distinguish between a) Fission and Fusion reaction b)Moderator and Control rods	**[10]**	**CO3**
7	Explain the construction and working of a four stroke diesel cycle engine	**[10]**	**CO3**
8	Describe with a neat sketch, the working of a simple open cycle gas turbine	**[10]**	**CO2**
9	Explain the Construction and working of pumped storage power plants with neat sketch.	**[10]**	**CO3**

SECTION-C — 40 Marks

10	Give a brief comparison between Steam, Hydro-electric, Diesel and Nuclear power plants.	**[10]** **[10]**	**CO4**
11	Explain the working operation of Pressurised Water Reactor (PWR) with neat sketch.	**[20]**	**CO3**
	(OR)		
11	Explain the working operation of Boiling Water Reactor (BWR) with neat sketch.	**[20]**	**CO3**