

Name:  
Enrolment No:



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

**Course: POWER GENERATION ENGINEERING (APEG2003)**

**Semester: III**

**Programme: B. Tech Electrical**

**Time: 03 hrs.**

**Max. Marks: 100**

**Instructions: All questions are compulsory**

**SECTION A**

S. No.		Marks	CO
Q 1	Distinguish between forced draft, induced draft and balanced draft system.	4	CO2
Q 2	Discuss the application of gas turbine power plant	4	CO1
Q 3	Explain the Rankine cycle. Discuss the processes which constitute the Rankine cycle	4	CO1
Q 4	Draw and explain the flue gas flow diagram of a thermal power station	4	CO2,1
Q 5	How can the storage requirements for a hydro project be determined?	4	CO2

**SECTION B**

Q 6	a) Draw a neat sketch of a diesel engine power plant showing all the important components b) Write a short note on lubrication system of diesel power plant.	10	CO4
Q 7	Discuss the utility of surge tank and forebay in the hydro –electric power plants	10	CO3
Q 8	Find the $U^{235}$ fuel used in one year in a 250 MW pressurized water reactor. Assume an overall plant efficiency of 33% and load factor 100%. Take No of atoms in one gram $U^{235} = 2.563 \times 10^{23}$	10	CO4
Q 9	Briefly discuss the functions of the following equipment in a thermal power station Feed water heaters and economizer.  OR Draw a typical layout of steam power plant. Explain the main features of layout.	10	CO2

**SECTION-C**


Q 10	Discuss the following: a) Nuclear power plant are used only as base load plants.  b) A nuclear reactor needs a moderator  c) In a pulverized water reactor, steam is supplied to the turbine is completely free from contamination  d) Discuss the economics of nuclear power generation	<b>20</b>	<b>CO3</b>
Q 11	a) Explain the specific speed of a hydro turbine.  b) A hydroelectric power plant produces 40 MW under a head of 40 m. If the overall efficiency of the plant is 72% and four turbines are planned in the power station. Determine the type of turbine and the synchronous speed of turbine and generator	<b>20</b>	<b>CO4</b>

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<b>Name of the School</b> <small>(Please tick, symbol is given)</small>	:	SOE	☒	SOCS		SOP	
<b>Programme</b>	:	B. Tech. EE					
<b>Semester</b>	:	III					
<b>Name of the Course</b>	:	Power Generation Engineering					
<b>Course Code</b>	:	EPEG2003					
<b>Name of Question Paper Setter</b>	:	Ram Mohan Sharma					
<b>Employee Code</b>	:	40000868					
<b>Mobile &amp; Extension</b>	:	9997636035 / 1211					
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**Note: - Pl. start your question paper from next page**

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End Semester Examination, December 2018

Programme Name: B. Tech. (EE)

Semester : III

Course Name : POWER GENERATION ENGINEERING

Time : 03 hrs

Course Code : EPEG2003

Max. Marks: 100

Nos. of page(s) : 2

Instructions: All questions are compulsory

## SECTION A

S. No.		Marks	CO
Q1	Discuss why the overall efficiency of a thermal power plant is low	4	CO2
Q2	Compare the open cycle and closed cycle gas turbine power plant	4	CO1
Q3	Discuss the advantage and disadvantages of a nuclear power plant.	4	CO2
Q4	State the advantage and disadvantage of steam power station as compared to hydroelectric Power station	4	CO2
Q5	Explain the functions of the steam drum in a water tube boiler	4	CO3

## SECTION B

Q6	a) Compare the Gas turbine power plants with Coal based thermal power plants b) With a neat sketch, explain the working of boiler water reactor	10	CO4
Q7	Explain the different types of cooling towers for a coal fired steam-generating station. Discuss any one.	10	CO2
Q8	Discuss the factors which should be considered while selecting a site for Coal based thermal power plant	10	CO2
Q9	With the help of neat diagram, explain the speed regulation system of Pelton wheel turbine  OR Discuss the economic feasibility of a pump storage schemes and write short note on development of pump storage plant in India.	10	CO3

## SECTION-C

Q10	a) A 60000 HP 130 RPM turbine operates at 40 m. Find out the specific speed of turbine.  b) The following data relates to a hydroelectric power plant: Head: 50 m Discharge: 500 m <sup>3</sup> / sec	20	CO4
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	<p>Turbine efficiency: 88%</p> <p>Frequency of generation: 50 Hz.</p> <p>Number of poles: 24</p> <p>The generator &amp; turbine are directly coupled. Calculate the number of turbines required if</p> <ol style="list-style-type: none"> <li>i. Francis turbine is used with a specific speed 300</li> <li>ii. A Kaplan with a specific speed of 750 is used.</li> </ol>		
Q 11	<p>a) With a neat sketch, explain the working of CANDU reactor</p> <p>b) Discuss the features of combined cycle operation of steam and gas turbine power plants</p> <p>c) Find the power produced by fissioning of 10 gm grams of <math>U^{235}</math></p>	<b>20</b>	<b>CO3</b>