UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

UPES
THE NATION BUILDERS UNIVERSITY

End Semester Examination – April, 2017

Program/course: B.Tech ASE	**Semester –**	**VIII**
Subject: Space Science & Environment	**Max. Marks**	**: 100**
Code : ASEG 485	**Duration**	**: 3 Hrs**
No. of page/s: 2		

SECTION A (45 pts)

1) **Define the following terms. (10 pts)**

   a) Apparent Magnitude:
   b) Parsec:
   c) Interstellar Reddening:
   d) Plasma sphere:
   e) Dark Energy

2) **Please describe the following statements as true or false. (10 pts)**

   a) The temperature increases in the Troposhere as you go up in altitude. (T/F)
   b) Ionosphere only starts above the Thermosphere (T/F)
   c) Earth's magnetic north is stationary until the next major solar event (T/F)
   d) Europa is the sixth largest moon in our solar system (T/F)
   e) Objects with less than critical mass shine only dimly and are termed Red dwarfs (T/F)
   f) Maria are the seas on the moon made from dry ice (T/F)
   g) Apparent brightness is an intrinsic property of the star (T/F)
   h) Dark Nebula are dense clouds of molecular helium which partially or completely absorb the light from stars behind them (T/F)
   i) Temperature of the brown dwarf is more than red dwarf (T/F)
   j) White dwarfs have a mass similar to that of the Sun, but only 1% of the Sun's diameter (T/F)

3) **What are the 4 main theories for the creation of the Moon? (8 pts)**

4) **What are 5 main effects of Space Weather in Ground Systems? (5 pts)**

5) **Give short answers to the question below? (12 pts)**
   a) What is the average temperature of the surface of the sun?
   b) Which part of the sun has the maximum fusion reaction?
   c) What is the distance of the Andromeda Galaxy from Milky Way?
   d) Solar System is in which arm of the Milky Way Galaxy?
   e) A blackhole with 50 solar masses will have an event horizon at how many km?
   f) What is the Chandresekhar Limit?
   g) What is more in abundance in the universe? Dark Matter or Regular Matter?
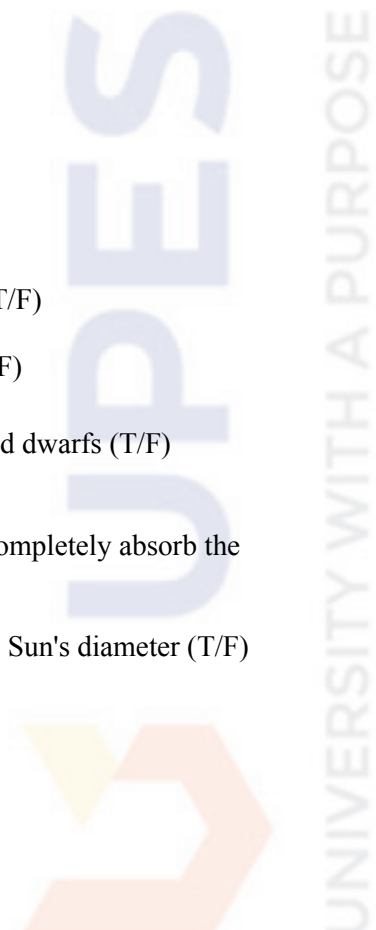
h) What are the two well known moons of Mars is?
i) The three abundant materials in Jupiter are?
j) The most famous moon of Uranus is called:
k) What is the absolute magnitude and the apparent magnitude of the Sun?
l) The radius of Oort cloud is how many AU?

SECTION B (40 Marks)

6) **If we choose 30 parsecs for absolute magnitude definition, then rewrite and redefine the equation for m-M (10 points)**

7) A binary star is perceived as a single star with a combined apparent magnitude of 2.37 and one of the stars in the binary system has an apparent magnitude of 3.96. Find the apparent magnitude of the other star (10 points)

8) **A supernova has a maximum apparent magnitude of -1. The apparent magnitude of the star before the supernova was 19. How many times has the intensity (I) has increased? (5 points)**

9) **If a star has a surface temperature of 25000 K then find the relationship of how many times more energy is outputted from this star as compared to our Sun? (5 points)**

10) **There is a neutron star with an effective temperature of 10000 K and luminosity of 0.01. What is the radius of this neutron star in terms of our sun? (Only For this problem take T_{sun} as 5000 K) (10 points)**

SECTION C – APPLICATION (15MARKS)

11) **Write the main timeline for Big Bang and describe at which time did major events occur until the universe took its shape that we know today? Describe the Big Bang Theory in detail (10 pts)**

12) **What are the 3 main theories for the end of the universe? Describe in detail. (5 pts)**

EXTRA CREDIT

13) *What is the name of the computer in 2001? What is the name of the Commander of the Mission? In which moon does the film 2001 end?*